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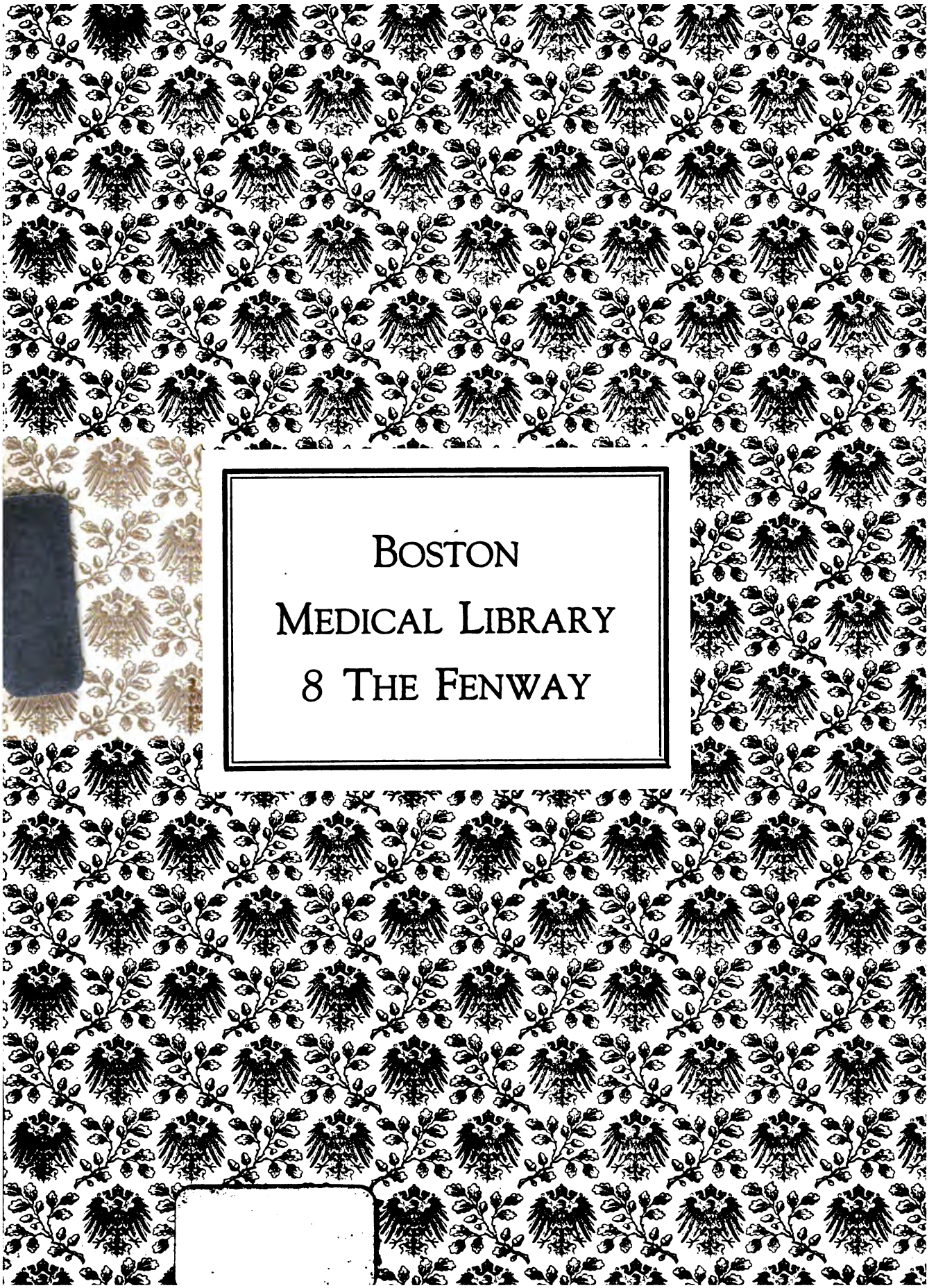
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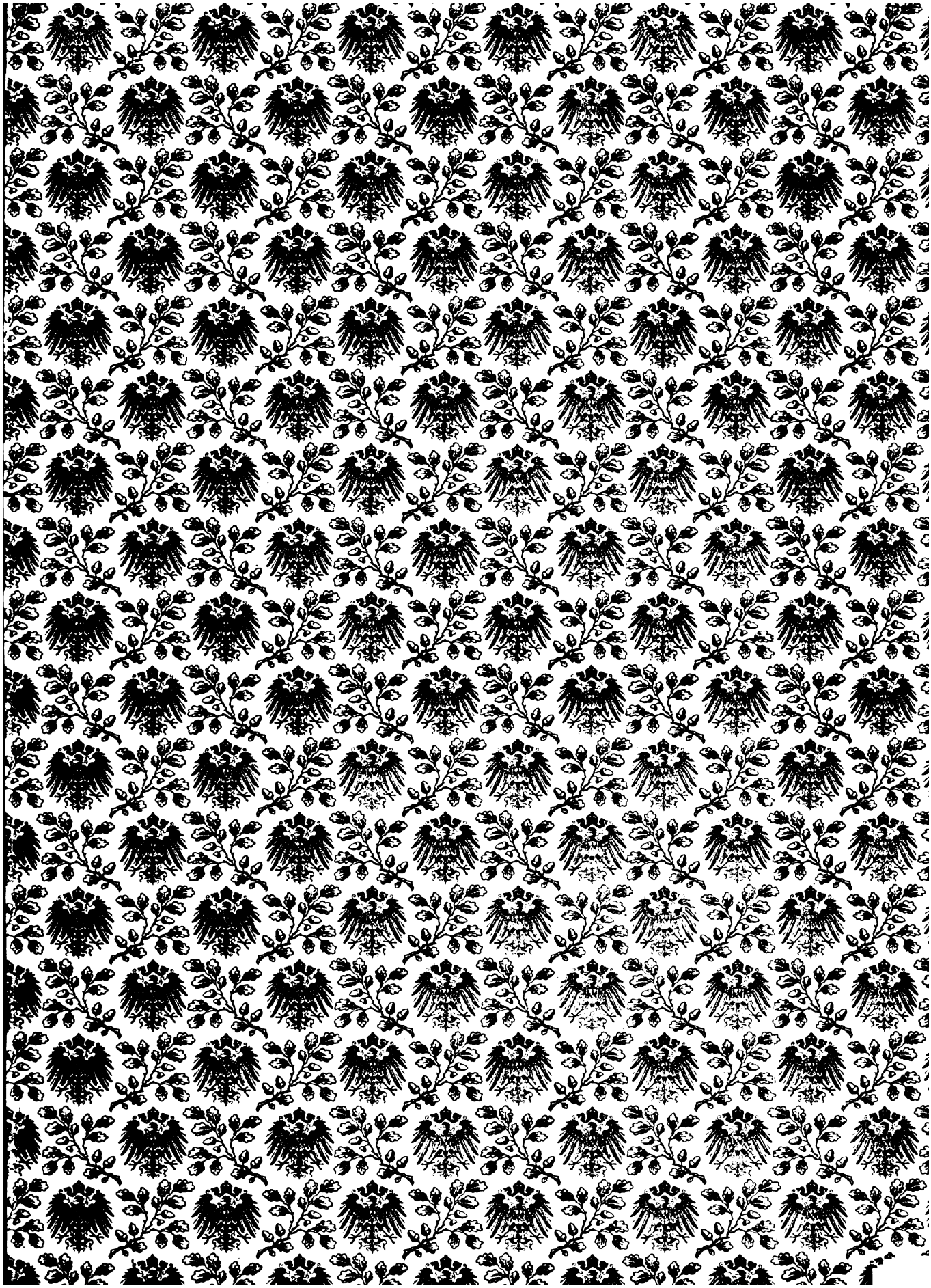

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THE

THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A MONTHLY JOURNAL

OF

Practical Therapeutics

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WHOLE SERIES, VOL. XXXI. THIRD SERIES, VOL. XXIII.

E. G. SWIFT,

DETROIT, MICH.

1907

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THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series. Vol. XXXI. | DETROIT, MICH., JANUARY 15, 1907. | Third Series. Vol. XXIII, No. 1.

PUBLISHER'S ANNOUNCEMENT.

With the THERAPEUTIC GAZETTE—the oldest, strongest, most widely circulated of our three medical journals—we have consolidated the MEDICAL AGE and MEDICINE, the current issue constituting the initial number of the united publications.

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The greater THERAPEUTIC GAZETTE will be conducted so as to meet the needs of active practitioners, and it will be, in the broadest sense, a representative journal of practical therapeutics.

THE PUBLISHER.

ORIGINAL COMMUNICATIONS.

AN ANALYSIS OF THE KIDNEY CONDITION OF EIGHT HUNDRED CASES OF SCARLET FEVER TREATED WITH ROUTINE DOSES OF CHLORAL HYDRATE: THE ANALYSIS CONTRASTED WITH SEVEN HUNDRED AND FIFTY-SIX CASES HAVING THE USUAL REMEDIES.

BY B. FRANKLIN ROYER, PHILADELPHIA,

Chief Resident Physician, Municipal Hospital of Philadelphia.

During the latter part of 1904 we began a study in the Municipal Hospital to determine the value of chloral hydrate in the treatment of scarlet fever. As long ago as 1896 Dr. James C. Wilson advocated routine doses of this drug in the treatment of scarlatina. Dr. Wilson believes that he secures an increased diuresis thirty-six to forty-eight hours after its administration has been begun. He thinks that in some way chloral protects the functionating part of the kidney tissues, that the nervous symptoms are greatly modified, that the itching is allayed, and that the patient is made more comfortable.

In beginning this study we were skeptical as to the value of this drug in scarlet fever. We believed that rest in bed with good nursing, simple diet, and large quantities of pure water were the only useful adjuncts to be used routinely. We fully expected to prove chloral hydrate valueless in the treat-

ment of this disease. A few weeks' trial, however, convinced us that Dr. Wilson's claims were for the most part easily proven, and that chloral hydrate did appear to be the most useful remedy yet advocated in the treatment of scarlatina. Dr. Wilson's claim that the patient is made more comfortable is plainly evident to those who use chloral; so too with his claim for the amelioration of the nervous symptoms and the control of itching.

We next turned our attention toward danger-signals, more particularly toward evidences of circulatory depression. We were bound to the universal teaching that chloral hydrate is a circulatory depressant and dangerous in asthenic conditions. We naturally expected to find this drug dangerous to many cases. After having treated nearly a thousand patients with doses of sufficient size to produce light somnolence, we feel that chloral hydrate does not materially depress the circulation. We believe that in no instance did the drug act clinically as a serious depressant. We have given it to patients greatly prostrated on admission, and have discontinued it after a few doses were given because of our prejudice against the drug and of our early training. After having a larger experience we rarely discontinued its use no matter what the degree of depression might be.

One claim made by Dr. Wilson, however, we were unable to confirm, viz., that of early diuresis. We undoubtedly do get an increased flow of urine twenty-four to forty-eight hours after the patient has been committed to our care. We meet with this same increase in flow of urine in patients treated by other remedies. We are inclined to attribute this increased flow of urine to better nursing, to the systematic use of water in definite quantities, insisted upon whether the patient wants it or not, and to the greater ease with which liquids are swallowed as the angina subsides.

The particular study undertaken at this time relates to the kidney condition met with in the postfebrile period. We have studied eight hundred cases which were treated with routine doses of chloral hydrate given in quantities sufficiently large to produce light somnolence, and have continued its administration in this dose five or six days after the fever subsided. A series of 756 patients treated by the usual remedies (a few of them perhaps having a dose of chloral to quiet extreme restlessness at night; most of them, however, having no chloral at any time) were analyzed in exactly the same way. The patients in each series were parallel cases as nearly as we could select them. All histories were excluded in each series where other infectious disease or other serious illness was combined with scarlet fever. Three patients died in the chloral series, and four died in the usual remedy group. We find that in the febrile period no material difference was found in the number of those having either mild, transient, or severe nephritis. In the postfebrile period it will be seen that of the 300 having routine doses of chloral hydrate the percentage of those having postfebrile albuminuria is 4.25 as against 5.68 in the series treated without chloral; in those having a transient postfebrile nephritis 3.50 as against 5.29 per cent without chloral, and of those having severe postfebrile nephritis 2 as against 2.38 per cent without chloral; in the total of all forms of postfebrile nephritis, 5.50 per cent in those having chloral, as against 7.76 per cent in those not having chloral, or the apparent total saving of 2.17 per cent of postfebrile nephritis.

POSTFEBRILE CONDITION OF KIDNEYS—CHLORAL SERIES.

Treatment.	Postfebrile albuminuria.	Postfebrile transient nephritis.	Postfebrile severe nephritis.
Chloral hydrate alone 22	0	1	0
Chloral hydrate and antitoxin (immunizing or larger dose).. 26	2	0	0
Chloral hydrate and usual remedies.....221	12	10	1
Chloral hydrate, usual remedies, and antitoxin.... ..531	20	17	15
Total chloral hydrate.800	34	28	16

Total number treated with chloral.... 800
Total number developing postfebrile nephritis..... 44
Percentage developing postfebrile nephritis.....5.50

POSTFEBRILE CONDITION OF KIDNEYS—USUAL REMEDY SERIES.

Treatment.	Postfebrile albuminuria.	Postfebrile transient nephritis.	Postfebrile severe nephritis.
Usual remedies alone. 526	26	26	13
Usual remedies and antitoxin.....230	15	14	5
Total having usual remedies.....756	41	40	18

Total number having usual remedies 756
Total number developing postfebrile nephritis..... 58
Percentage developing postfebrile nephritis.....7.76

It will be seen in the first table presented that antitoxin was used in many cases of each series tabulated. There may be those who believe that antitoxin irritates kidneys and that it may even cause nephritis. We have therefore separately classified those having antitoxin in the succeeding table. It apparently demonstrates that nephritis is a little more frequent in those patients having antitoxin.

CLASSIFIED IN ANTITOXIN GROUPS.

Treated by.	Total.	Total nephritis.	Percentage.
Chloral hydrate..... 22 Chloral hydrate and usual remedies.....221	243	12	4.93
Chloral and antitoxin. 26 Chloral, other remedies, and antitoxin..531	557	32	5.76
Grand total..... ...	800	44	5.50
Usual remedies.....526	526	39	7.43
Usual remedies and antitoxin.... 230	230	19	8 26
Total.....756	756	58	7.76

Of this series 243 had chloral hydrate and usual remedies—12 developed nephritis, a percentage of 4.93; 557 had chloral and the usual remedies, and were either immunized or given larger doses where attacks were anginose—32 developed nephritis, a percentage of 5.76. Of those not having chloral, 526 were given the usual remedies alone—39 developed nephritis, a percentage of 7.43; 230 had the usual remedies and antitoxin, 19 with nephritis—a percentage of 8.26.

Here just a word of explanation. It has been our custom at the hospital to give a dose of 5000 units or more of diphtheric antitoxin to all anginose cases of scarlet fever. In these antitoxin groups we have all the severe cases of anginose scarlet fever. The number in each group not having antitoxin is practically *nil*. It is from the antitoxin group then that nephritis is to be expected. This explanation is made so that antitoxin may not be misjudged.

It is believed that some inquiry as to the day of disease when postfebrile nephritis most frequently develops might be of interest. The third table presented shows the day in the disease when nephritis may be anticipated. The period of greatest danger is shown to be the period from the twentieth to thirty-second day, or the third week and the early part of the fourth week.

A further division of the 800 patients having chloral shows that of the 16 having severe postfebrile nephritis, two had febrile albuminuria, one transient febrile nephritis, and three had severe febrile nephritis, one of which had severe nephritis on admission. In two patients of this group the nephritis extended to the postfebrile period. Eleven patients of this group escaped kidney symptoms in the febrile period and are classified as scarlatina simplex. Five are classified as scarlatina anginosa. Fifteen of this group showed hyaline and granular casts in the urine, five epithelial casts, and two blood casts. In three marked edema is noted; in three puffiness about the eyes alone is noted.

NEPHRITIS IN CHLORAL SERIES.

Classified to show day of disease postfebrile nephritis developed.

	3d week 12							4th week 18								5th week 5							6th week 4						
Day of disease.....	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
No. developed nephritis...	*5	1	1	0	0	2	3	0	6	1	2	2	5	2	1	2	0	1	0	0	2	1	1	0	0	2	1	0

Period of nephritis, postfebrile.

*Two continued from febrile period.

In three the notes show the quantity of urine to be scanty, in ten the quantity is fair, and in three a good quantity is noted. In three patients in this group albumin was found from one to three days before casts appeared.

Of the 28 having transient postfebrile nephritis, seven had febrile albuminuria. Nineteen of this group had scarlatina simplex, eight had scarlatina anginosa, and one had scarlatina hemorrhagica. All of this group escaped nephritis during the febrile period. In 20 urines hyaline casts were noted, in 25 granular casts were found, in four epithelial casts were seen, two showed blood casts, and one had leucocyte casts. Two are noted as having marked edema, two puffiness about the eyes. One showed scanty urine, two fair quality, 25 good quality, one of which had polyuria. Five of this group showed albuminuria from one o three days before casts were demonstrable. In two of this group a trace of albumin could be demonstrated for fifteen days before casts were found.

The following conclusions may be drawn:

First, chloral hydrate is of distinct value in the treatment of scarlet fever, and when used in doses of sufficient size to secure light somnolence does not seem to be a circulatory depressant.

Second, chloral hydrate ameliorates nervous symptoms better than any remedy yet suggested in the treatment of scarlatina.

Third, chloral hydrate allays the itching of the skin often found annoying in scarlet fever.

Fourth, when chloral hydrate is given routinely during the febrile period and for some days thereafter, postfebrile nephritis appears to be less frequent.

Fifth, this study would seem to justify the more extended use of chloral in the treatment of scarlet fever, and a more detailed study as to how it acts on the kidney itself.

THE TREATMENT OF GONOCOCCIC CONJUNCTIVITIS, WITH SPECIAL REFERENCE TO THE SILVER SALTS.[1]

BY G. E. DE SCHWEINITZ, M.D.,
Professor of Ophthalmology in the University of Pennsylvania.

Purulent conjunctivitis caused by the entrance of the gonococcus of Neisser into the conjunctival sac occurs in three forms: As gonococcic conjunctivitis in adults, which usually can be traced to its source of contagion from an acute gonorrhea or a gleet, or from contact with soiled fingers or linen, or from an eye similarly affected; as gonoblennorrhea of young girls who are the subjects of gonococcic vaginitis;[2] as conjunctivitis neonatorum (ophthalmia neonatorum), caused by the introduction into the eye of the infecting material from some portion of the genito-urinary tract of the mother at the time of or shortly after birth.

Referring to the first of these forms of gonorrhea of the conjunctiva, namely, gonococcic conjunctivitis of adults, with the symptoms of which you are now familiar, I desire to say a few words in regard to the treatment, with special reference to (*a*) the most satisfactory irrigating fluid; (*b*) the local use of cold; (*c*) scarification of the conjunctiva; and (*d*) the comparative value of certain of the salts of silver.

Ordinarily, the freely produced pus may be removed by frequent irrigations with a saturated solution of boric acid, a solution of bichloride of mercury, 1:10,000, or one of cyanide of mercury, 1:5000. In general terms it may be said that the use of strong solutions of most germicides—for example, bichloride of mercury—is not advisable, because they cannot be employed in a strength which would be bactericidal lest they injure the cornea and add to the danger which the treatment is intended to avert. These

[1] A clinical lecture delivered in the Hospital of the University of Pennsylvania.

[2] Young boys occasionally have gonococcic conjunctivitis, contracted from various sources of infection—for example, sleeping with adults who have gonorrhea, from soiled linen or towels, and, rarely, from an acquired urethral gonorrhea.

solutions must be regarded simply as cleansing agents, and not as specific medicaments, and hence boric acid solution is satisfactory and safe.

One remedy, however, has a more particular relationship to the cure of this disease, namely, permanganate of potassium in a solution of the strength of 1 to 2000 to 1 to 5000, used copiously, a pint at a time, in continuous irrigation after the manner of Kalt. These irrigations should be employed three or four times a day, according to the severity of the case and the quantity of the discharge. They are not applicable to, or necessary for, all cases, but should be reserved for those, only too often encountered, which fail to show improvement with those remedies which have been and will be mentioned. Under suitable conditions their value is great.

During the early stages of florid gonococcic conjunctivitis, provided the patient is robust and the cornea is not involved, the local application of cold is a useful agent. Upon a block of ice square compresses of gauze are laid and thoroughly chilled. These in turn are placed upon the swollen lids, and as frequently changed, at least every half minute, as may be needful to keep up a uniform cold impression. According to their effect, they may be used almost continuously, or every two or three hours for twenty minutes at a time.

Not all ophthalmic surgeons are in accord as to the value of cold applications under these circumstances. For example, Eugene Fick believes that they are "superfluous, if not actually harmful," and Myles Standish concludes that "the application of cold is at least of doubtful value, and that probably its effect is harmful."

The normal temperature of the lower conjunctival fold is about 96° F.; under the influence of inflammation it rises, and in the disease under consideration, according to some investigations of Standish, it may reach 100° F. The growth of the gonococcus is inhibited by a temperature of 86° F.; but it is doubtful if by any safe application of cold the temperature of the conjunctival sac can be reduced to this degree, and therefore an actual stopping of the growth of the gonococci cannot be expected from this treatment. Knies, however, has shown that these microörganisms develop only slowly at a temperature of 90° to 92° F., and John Weeks has demonstrated that by a proper use of cold the conjunctival temperature may be lowered to 92° F., at which temperature there is undoubted retardation of the growth of the gonococci. Hence cold is a useful remedy in this respect, and, moreover, it gives the patient relief from severe suffering.

According to my experience, cold properly applied during the first thirty-six hours of the disease, provided the nutrition of the cornea is intact, is an excellent remedy, productive of great comfort to the patient, and I have yet to see a case in which the slightest harm could be attributed to its use.

In many cases of gonococcic conjunctivitis there are marked chemosis and infiltration of the ocular conjunctiva, so that a hard ring of swollen tissue surrounds the cornea, which appears to be lying at the bottom of a small pit. Such a condition of affairs naturally shuts off the nutrition of the cornea, and unless relief is speedily given ulceration and sloughing of the cornea will follow. Nothing in my experience equals in value the effects of scarification of the infiltrated tissue, as follows: With a sharp Graefe knife, radial incisions from within outward are made through the entire depth of the swollen tissue, and repeated on succeeding days if the chemosis and infiltration return. Great care must be taken not to scratch or cut the cornea during the necessary manipulations. After the scarification, the conjunctival sac should be gently irrigated with a saturated boric acid solution, until the bleeding and serous oozing cease.

Thus far we have considered remedies, with, perhaps, the single exception of permanganate of potassium, which, useful as they are, have no special action in controlling the disease we are discussing—that is to say, they are not germicides, or, rather, they cannot be employed safely in a strength which renders them actively germicidal. To render aid in this respect, nitrate of silver has maintained an

important relationship to the therapeutics of gonococcic conjunctivitis, and from a period long anterior to the discovery of the gonococcus of Neisser and to bacteriological examination it has been employed as a potent remedy in the treatment of purulent conjunctival diseases. It acts as an astringent, a superficial caustic, a germicide, and an alterative, and continues to be, in my experience, the most satisfactory remedy in this disease, *provided it is properly applied,* as follows: The conjunctival sac is first thoroughly irrigated and all pus and lymph carefully washed away. Next, both lids are everted so as to obtain full exposure of the swollen tarsal conjunctiva. With a small cotton mop, which has been dipped into a freshly prepared two-per-cent (gr. x-f℥j) solution of nitrate of silver, the conjunctiva thus exposed is gently but thoroughly painted until a white film, due to the formation of chloride of silver and coagulated albumin, forms. With a physiologic salt solution the surface is next irrigated until every particle of the white film which has formed is washed away, and a clean red surface remains. The lids are then restored to their normal position and the sac once more irrigated. By this means all the nitrate of silver is neutralized, and all substances which might irritate or injure the cornea are removed. Finally, iced compresses are applied for five or ten minutes. It is usually not necessary to make this application more than once a day, and it should always be made either by the physician in charge or by a suitably trained nurse. The solution should never be dropped into the conjunctival sac, but painted over the surface of the mucous membrane, and must always be neutralized in the manner described.

If nitrate of silver is carelessly used, or imperfectly neutralized, or applied in too strong a solution, it is liable to do harm and defeat the very object for which it is employed, and doubtless in many instances, in the absence of proper precautions or imperfect technique, it has been followed by a reactive irritation which was distressing, or an injury to the corneal epithelium which was positively harmful. Therefore, when some years ago various preparations of silver, generally described as the "newer salts of silver," began to make their appearance, they were hailed with satisfaction and freely used in place of the nitrate of silver. At the present time there are about fifteen of these compounds of silver available, but I have time to speak of only a few of them, and especially of protargol and argyrol.

When protargol was introduced, about ten years ago, it was widely employed and enthusiastically indorsed by many surgeons, because it was believed to possess the necessary bactericidal qualities and to be free from the irritating properties of nitrate of silver. The number of its advocates have materially lessened, although it continues to be used by many physicians.

In a notable investigation of the comparative value of the silver salts in the treatment of gonorrheal conjunctivitis, published by Myles Standish in 1904, and based upon a large experience in this disease in Gardner Building, attached to the Massachusetts Charitable Eye and Ear Infirmary, the drug received strong indorsement. Ordinarily it is employed in 10 to 20 per cent, the 10-per-cent strength being preferable, and is dropped freely and frequently into the conjunctival sac. Some surgeons apply stronger solutions directly to the everted lids; usually this is unnecessary.

The drug thus used is warmly commended as greatly preferable, and indeed superior, to nitrate of silver by many clinicians, notably by Standish in this country, by Darier in France, and by Pfalz in Germany, and their recommendations are based upon large experience and comparative studies. That it is an active bactericidal agent, although not as potent as nitrate of silver, and that it is far less irritating, although not without irritating qualities, than the latter drug, is well known; but that, in spite of these good qualities, it is often inefficient, uncertain, is sometimes badly borne, and is prone to cause permanent staining of the conjunctiva is equally well known, and many surgeons of large experience have abandoned its use in favor of nitrate of silver or other methods of combating gonococcic conjunctivitis.

Naturally, each physician must ultimately be governed by his own experience and results, and after a faithful trial of the drug and following all directions of its advocates I have been unable to persuade myself that protargol has a single advantage over nitrate of silver in the treatment of gonorrheal conjunctivitis of adults, and more than this it is, in my experience, not nearly so certain in its action, and I have ceased to employ it in this disease.

About six years ago two well-known pharmaceutical chemists of this city developed another silver compound, known as argyrol, which was at once received with favor, and which has been widely used in the treatment of all forms of purulent conjunctivitis. It has been particularly recommended in England by Stephenson and Hinshelwood, in France by Darier, and in this country by Myles Standish, Henry D. Bruns, and many other surgeons. I have used the drug very freely during the last five years, and was at one time very much impressed with its value, and particularly with its entirely bland and unirritating qualities. Little by little, however, it became apparent that it was inefficient in certain cases of the character which are now under discussion, and I was obliged to return to the other methods which have been previously described, although I continued to use it in others. The same experience was shared by a number of my colleagues, particularly those in the Philadelphia General Hospital, as well as by many surgeons in other cities and countries. We became convinced that either the preparation had altered in its qualities, or that we had had a fortunate series of cases at first and were deceived in regard to the specific value of its universal application in this disease, although not in regard to a certain value, presently to be described.

The reason for its failure is made evident in a notable contribution by Dr. George S. Derby, of Boston, who studied the bactericidal properties of this and various silver preparations. He found, in the first place, that although the manufacturers claim that it does not precipitate with albumin or with urine, and that it is an efficient bactericide, a precipitate is obtained in the presence of albumin and of urine, and that its bactericidal power is exceedingly weak. Thus, in a large series of observations a growth of the staphylococcus pyogenes aureus was obtained after exposure to 10-per-cent, 25-per-cent, and 50-per-cent solutions of this drug for one hour. Its action was always uncertain. While occasionally the germs were noted after a twenty-minute exposure, more often the cultures taken at the end of one hour showed a growth when examined twenty-four hours later. The age of the solution did not appear to be of importance. Dr. Derby's conclusions have in all respects been confirmed by C. R. Marshall and E. F. M. Neave in England in their research on the bactericidal action of compounds of silver. They found that argyrol, and also collargol, possess practically no bactericidal action whatever, and, moreover, that the percentage of silver which these compounds contain is no criterion of their bactericidal power; for example, collargol has a percentage of 86.6 of silver, while argyrol has a percentage of 20. Therefore any good effects, as they point out, which many clinicians maintain that they have obtained with argyrol cannot be attributed to any action which it has upon bacteria, inasmuch as such action is practically *nil*.

Standish, on the other hand, perfectly familiar with these bacteriological investigations, believes that the drug must have greater bactericidal qualities in the disease which we are discussing than the laboratory experiments upon other microörganisms would lead us to expect, and practically the same conclusions are reached by Darier.

Now a word in regard to the proper method of using argyrol: First, as the pharmaceutical chemists who have introduced the preparation properly insist, it must be freshly prepared; secondly, the conjunctival cul-de-sac should be kept flooded with it. Standish recommends the free instillation of a 25-per-cent solution every two or three hours, but I believe that what Henry D. Bruns calls the "immersion method," and which is the one that I myself have always employed, is still better, namely, that the instillations should be as

frequent as may be necessary to keep the conjunctival surfaces constantly bathed in the solution, which may be readily carried out because it is perfectly bland and unirritating. But I am also satisfied that by itself it is not sufficient, and I would neither advise you nor permit myself to treat a case of active gonococcic conjunctivitis in an adult with this drug alone, but would either use it in association with nitrate of silver, in the manner which I shall presently describe, or omit it altogether, and trust to the nitrate of silver treatment.

In Standish's most recent communication on this subject he records fifty-two cases of gonorrheal ophthalmia in adults which entered the infirmary connected with the Massachusetts Eye and Ear Hospital with clear corneas, which were treated with argyrol, with subsequent corneal infection in twenty-two cases, or 44 per cent +. In only four of these cases, however, was there total leucoma, or loss of the eye, giving as a result 58 per cent with recovery, or only approximately 7½ per cent in which the outcome was a blind eye.

Recently Dr. T. B. Holloway has investigated in a most painstaking manner the cases of gonorrheal conjunctivitis which have been admitted to the Philadelphia General Hospital during the last six years. Among the adult cases there were 106 eyes, 64 of which entered with clear corneas. It is interesting to compare the results in so far as nitrate of silver and argyrol are concerned. Nitrate of silver was used in 31 eyes, with corneal involvement in 8, or 25.8 per cent; while argyrol was used in 20 eyes, with corneal involvement in 4, or 20 per cent. It will thus be seen that comparing these two drugs, although the number of eyes treated with nitrate of silver was greater than the number of those treated with argyrol, there is a slight advantage, in so far as corneal involvement is concerned, in favor of the latter drug. But comparing these statistics with those furnished by the Massachusetts Eye and Ear Infirmary, in which, with a greater number of cases treated with argyrol, there was a subsequent corneal infection in 22 of them, or in 44 per cent, almost double the number of corneal involvements which, to be sure in a smaller number of eyes, we secured in the Philadelphia General Hospital with nitrate of silver.

But, gentlemen, statistics are not entirely trustworthy to establish the value of any single remedy. One must stand over each case and observe the progress of the disease from day to day, and because I have watched a large number, not only of the 64 eyes which entered with clear corneas, but of the 106 eyes which compose the total number of gonorrheal ophthalmias in adults which we have treated in the last six years in the Philadelphia General Hospital, in which 42 already had corneal involvement when they entered, and because in a large number of these cases we have failed to control the activity of the process with argyrol and were obliged to return to nitrate of silver, I am satisfied that the drug is not to be trusted in any sense as a specific in this infection.

You will naturally say, how then do you account for its enthusiastic indorsement by clinicians of large experience, whose results you have already quoted to us? It seems to me that Derby has answered this question in a satisfactory manner. He says: "Argyrol appears to be an almost inert solution. It is sterile and soothing; it mechanically washes away the pus; it certainly does not harm and does not deter nature from doing her best." He then adds: "Would not normal salt solution be as efficient and less objectionable?" Physiological salt solution would not act as well for the simple reason that it does not do one thing which in my judgment is the chief value of this drug, namely, as Standish has well shown, its power of diffusing itself, of penetrating all of the crevices of the inflamed folds of the conjunctiva, which it coats, and of floating the pus and mucus to the surface, from which it can be readily removed by a mild irrigation, or even by an ordinary wiping of the lips of the palpebral fissure. Nurses of experience in the care of cases of gonorrheal conjunctivitis declare that they have been much more easily managed since the introduction of argyrol, and for this reason alone: they

have been able, provided the drug is used according to the immersion plan already described, with much greater ease than formerly to keep the conjunctival sac freed from purulent secretion, but they will also testify that in so far as the Philadelphia General Hospital is concerned the drug is not competent to check the disease, and that something in addition to the argyrol must be used. I cannot, therefore, recommend it to you by itself as either a certain or safe remedy in this disease, although I indicate a certain use to which it should be put.

Now a word in regard to the method according to which I believe these cases should be treated. Other things being equal, iced compresses during the first thirty-six hours; frequent mild irrigations with a saturated solution of boric acid, great care being exercised that no bruising or scratching of the cornea shall take place, the elimination of the pus being materially aided by keeping the conjunctival sac constantly floated in a 25-per-cent solution of argyrol, which, in the manner already described, materially aids in bringing to the surface from the hidden folds of the swollen conjunctiva the purulent secretion; finally, the careful application, at least once a day, of a 2-per-cent solution of nitrate of silver in the manner and with all of the cautions which I have already described. In a certain number of cases even this treatment is not sufficient, and then solutions of permanganate of potassium seem to be efficacious. Always, if there is a swollen ring of chemotic conjunctiva surrounding the cornea, this should be deeply and thoroughly scarified.

In concluding this lecture I have to say only a few words in regard to ophthalmia neonatorum, in which disease the prognosis is not nearly so unfavorable as in gonorrheal conjunctivitis of adults, provided the patient is seen early. It is rarely necessary to use cold, although occasionally, during the first twenty-four hours of the case, intermittent applications of cold compresses are required. Many surgeons believe that in the treatment of conjunctivitis neonatorum argyrol usually achieves better results than nitrate of silver, not because the physiological action of the drug, its penetrating powers, or its bactericidal properties are more efficient in controlling the disease than those of nitrate of silver, but because it is more easily applied and is less irritating, and hence in inexperienced hands a safer remedy. It should be distinctly stated, however, that in a certain number of cases argyrol, and also the protargol, will not be sufficient, and nitrate of silver must be used, especially as Bruns recommends and as I have already described to you when speaking of gonococcic conjunctivitis, in addition to and after the use of the former remedy. Not only in babies with gonorrheal conjunctivitis, but in adults, the greatest care must be exercised to maintain the nutrition of the patients, and it must be the experience of every one who sees large numbers of these cases that if for any reason there is alteration or depreciation of nutrition, or an intercurrent illness, an eye that has been progressing most favorably will suddenly take on an equally most unfavorable turn.

In the Philadelphia General Hospital, during the same period previously quoted, 109 eyes affected with conjunctivitis neonatorum were treated, 95 of which entered the hospital with clear corneas.[1] Nitrate of silver was used in 50, with corneal involvement in 6, or 12 per cent; while argyrol was used in 14, with corneal involvement in 1, or a little over 7 per cent. Standish reports 201 cases of ophthalmia neonatorum treated with argyrol, with subsequent corneal infection in only 4 cases, or 2 per cent, a result which, he believes, constitutes a strong argument in favor of argyrol.

The treatment of this disease should be as follows: Painstaking but gentle irrigations in the ordinary manner, and not with the aid of any of the most unnecessary special devices for introducing the fluid beneath the lids; rarely, and only in cases with much swollen lids and of robust nature, cold compresses for the first twenty-four hours; constant flooding of the con-

[1] In many of these cases the general nutrition was very bad.

junctival sac with a 25-per-cent solution of argyrol, which acts as a protective and which floats to the surface of the purulent material, rendering its removal more easy; most assiduous watching of the case and adding to the treatment always (and this is necessary in many of the cases) a daily application of nitrate of silver in the manner already described, provided the symptoms do not promptly subside under the argyrol treatment or any other measures which may be employed.

At the risk of repetition I would conclude by saying to you that in gonococcic conjunctivitis of adults neither protargol nor argyrol is a safe remedy when used by itself; that in so far as my own experience is concerned, protargol may as well be abandoned; that argyrol is useful because it is bland and unirritating and helps to remove the pus, but that it has no control over the specific nature of the disease; and that, thus far at least, there is no better remedy in our hands than properly applied solutions of nitrate of silver, which doubtless are more efficient than they were in the past because we have been able to use argyrol and similar silver compounds as adjuvants. Many cases of ophthalmia neonatorum are better treated with argyrol for the simple reason that it can do no harm; it acts as well as, and better than, most of the non-specific remedies. Nitrate of silver may do harm unless it is applied by a skilled hand, but its proper application is required in a certain percentage of our cases. At some future lecture I will take up the complications of this disease, particularly those cases in which either before treatment has begun, or in spite of treatment, there has been corneal involvement; and I will say now that to your treatment of the gonococcic conjunctivitis of adults atropine drops should be used in order to keep the pupil dilated from the very start and to lessen the tendency to hyperemia of the uveal tract. Internally, the patients should have opiates, if required, and supporting measures if they are depressed and anemic.

THE DIAGNOSIS AND TREATMENT OF MULTIPLE NEURITIS.[1]

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Diagnosis.—The development of a multiple neuritis may be gradual or rapid. It may or may not be attended by fever. It may involve the nerves of both legs, of both arms, of all four extremities, of the trunk, and of the head and face. At times the motor fibers of the nerves are especially attacked, and in such cases paralysis is the most prominent symptom. Sometimes the sensory fibers are especially attacked, and in such cases pain is the most prominent symptom. At other times, again, both motor and sensory fibers are attacked, and in such cases both paralysis and pain are present. All varieties of mixed motor and sensory involvement may be found: thus motor and sensory phenomena may exist in about equal proportion, or motor phenomena on the one hand or sensory phenomena on the other may predominate to a small or to a great degree. In a given case the same relative admixture of motor and sensory symptoms holds good, other things equal, for all of the parts involved. The motor disturbance, instead of consisting of muscular paralysis or weakness, may consist of incoördination, and this symptom may resemble that observed in tabes.

Multiple neuritis may be widely diffused or may be comparatively limited in extent. Usually corresponding or homologous parts are involved, the involvement being symmetrical, but this is not always the case. To the motor and sensory phenomena above detailed various sensory disturbances, such as numbness, paresthesia, tingling, prick-

[1] Read before the Philadelphia County Medical Society, Nov. 14, 1906.

ing, hyperesthesia, hypesthesia, or anesthesia, may be added; and also various trophic disturbances, such as atrophy of muscles, changes of electrical reaction, contractures, glossiness of the skin, lividity of the skin, edema, local sweating, arrest of growth in the nails, rarely ulceration. The tendon reflexes are usually lost early. The skin reflexes may persist, may be exaggerated, or may be lost.

Undoubted spinal symptoms are in pure cases absent; this is especially true of involvement of the sphincters. It is a fact of prime importance in the diagnosis of multiple neuritis that the sphincters are intact. Cerebral symptoms on the other hand are not infrequently present and manifest themselves as mental confusion; the symptom group being at present often designated as Korsakoff's psychosis.

The most common history of multiple neuritis is as follows: The attack begins slowly and without fever. The nerves of the lower extremities are attacked by preference. The first symptoms noted are usually paresthesias, such as tingling, pricking, numbness in the legs and feet; then often after several days there come on spontaneous pains which may be of a character suggesting rheumatism, or may be sharp, stinging, or darting. The cutaneous sensibility becomes diminished, and after a lapse of a variable period of time, days or weeks, a diminution of muscular power in the legs and arms is noted. Pain becomes more pronounced and the weakness slowly progresses; soon walking becomes difficult. This paralysis does not affect the different muscular groups equally. The muscles of the anterolateral aspects of the legs are ordinarily the first and most severely attacked; the patient is unable to flex or properly flex the feet, or to extend the toes. The patient in walking raises his feet as though he were ascending a stairway, and the gait is known as the "steppage gait." In typical cases the weakness becomes so pronounced as to produce foot-drop. Pains and other sensory disturbances as a rule are also noted in the forearms, wrists, and hands, and in typical cases weakness of the extensors at the back of the forearms makes its appearance, which when pronounced gives rise to wrist-drop. Involvement similar in character may be noted in the muscles of the thighs and in the muscles of the upper arms, though this involvement is much less pronounced than that noted in the distal portions of the extremities; it is as a rule but slightly marked in the thighs, and still less so in the upper arm.

The muscle masses and the nerve trunks are painful to pressure. This symptom is of great value. Frequently it is not the large nerve trunks that are painful, but the smaller branches; at least pain and tenderness are usually most pronounced in the latter. A ready method for testing for the presence of such tenderness—and especially valuable in cases in which the sensory symptoms are but slightly pronounced—consists in grasping the leg just above the ankle or the forearm just above the wrist. If any degree of sensory neuritis be present in a given case, pain is readily elicited by this test, even if the pressure exercised be moderate.

If paralysis becomes well established the muscles may in course of time present the reaction of degeneration and may also undergo some atrophy. The tendon reflexes are diminished or abolished. Hypesthesia or anesthesia is common in the distal portions of the extremities. Sometimes hypesthesia is noted only on the sole of the foot, while painful hyperesthesia may be noted elsewhere. Psychic symptoms, and at times also ocular palsies, may be added.

The affection may persist without change for some months, when as a rule the disturbances of sensibility gradually become less marked and finally disappear. The motor functions also are reëstablished little by little, and the limbs recover their usefulness unless grave contractures have supervened. While the tendency is to recovery in the majority of cases, we should bear in mind that the involvement of certain nerves, such as the phrenic and pneumogastric, may at any time interrupt the

progress and entail fatal consequences. However, this result is very rare.

The above sketch of symptoms of an average case with mixed motor and sensory involvement, such as may ensue from alcohol, suggests the query whether the symptoms in a given case will enable us to diagnosticate not only the presence of a multiple neuritis, but also to determine its probable origin. To this query we are compelled to return a negative answer, for the same poison may give rise to the different clinical forms of multiple neuritis; this is, for instance, true of alcohol. Thus the latter, while commonly producing palsies, may give rise to a pure or almost pure sensory form, in which pain and other sensory symptoms greatly predominate or alone are present, together with preservation of the tendon reflexes. Roughly speaking, the facts may be summarized as follows: Alcohol usually gives rise to a neuritis both motor and sensory, beginning in the distal portions of the lower extremities; lead gives rise to a motor neuritis, involving especially the distal portions of the upper extremities; arsenic to a neuritis both motor and sensory, usually beginning in the distal portions of the upper extremities, but also involving the lower; rheumatism to a diffused neuritis both sensory and motor; gout to an irregular neuritis which is especially sensory. A similar statement may be made in regard to diabetes. The various infectious diseases give rise to widely diffused neurites, both motor and sensory; these may be met with in the postfebrile period of typhoid fever and of other exanthemata, such as measles. Influenza may give rise to neuritis widely diffused and largely sensory; diphtheria to a motor neuritis characterized, as is well known, by an involvement of the soft palate, at other times by a widely diffused involvement giving rise to diphtheric ataxia; septicemia may give rise to a neuritis widely diffused or more or less localized according to the special etiology, and which is both motor and sensory. Tuberculous neuritis, which is rare, is sensory in type. Finally, malarial neuritis, which is also very rare, involves the legs most frequently.

Widely diffused or generalized forms of multiple neuritis usually present a predominance of motor phenomena. They may ensue in the decline or period of convalescence of an infectious disease, such as typhoid fever or diphtheria, as just stated. Their course is subacute. They begin by a rapidly increasing weakness in the distal portions of the lower extremities; after a few days this weakness is pronounced, or paralysis may be complete. The tendon reflexes are abolished. The paralysis invades the thighs, and usually after an interval also attacks the upper extremities, again beginning in the distal portions, the hands and wrists first, and spreading toward the trunk. Next the paralysis may involve the trunk—the abdomen, the thorax, the diaphragm; later the cranial nerves—the nerves of the medulla, the facial, the motor nerves of the eyes, the hypoglossal. Involvement of the pneumogastric may also, of course, occur. Spontaneous pain in nerve trunks is usually absent—at least it is not a marked feature; numbness and formication may be the only sensory symptoms complained of. The nerve trunks and muscles are usually painful to pressure, though even this symptom may be absent, as in the multiple neuritis following diphtheria.

Instead of the onset being subacute, multiple neuritis may come on suddenly, develop rapidly, and may be accompanied by a febrile rise. It may come on in a person previously well and without apparent cause. Such causes as exposure to cold, overwork, digestive disturbances, have been thought to play a rôle; at other times, as in cases of a less acute course, the symptoms have appeared after typhoid fever and other exanthemata, and also after alcoholic and arsenical intoxications. The attack may be ushered in by general malaise, chills, nausea or vomiting, diarrhea, fever, headache, backache, nervousness, depression, and sleeplessness. Paresthesias and numbness usually make their appearance in the extremities, and after one or more days pain

appears in nerve trunks and muscles. Little by little, but progressing rapidly, paralysis is established, the paralysis beginning, as usual, in the distal portions of the lower extremities, rapidly invading the upper extremities and the trunk. The clinical picture presented may resemble Landry's paralysis; indeed, the resemblance may be so close as to make a differentiation difficult or almost impossible. However, the fact that in true Landry's palsy the paralysis begins in the distal portions of the lower extremities and invades the trunk before it invades the arms is a point of considerable value. In multiple neuritis of the form here described the paralysis begins as a rule in the legs and then invades the arms. Sometimes involvement is simultaneous in both legs and arms. Involvement of the trunk subsequent to the arms would negative true ascending spinal paralysis. In the acute or febrile form of neuritis the more important cranial nerves most frequently escape; however, facial and oculomotor involvements may occur. The fever is as a rule of short duration. The patient usually survives the attack, and then muscular atrophy sets in. In this form the atrophy is rapid, diffuse, and irregularly distributed.

If we were asked to briefly summarize the symptoms of multiple neuritis, we might say that, as far as the motor symptoms are concerned, it is characterized by a flaccid paralysis, progressive in character, but with a decreasing intensity, symmetrical in distribution, beginning and most pronounced in the distal portions of the extremities, and spreading toward the trunk: the extensors of the toes and flexors of the foot on the one hand and the extensors of the hand and wrist on the other being most involved, giving rise to the familiar foot- and wrist-drop. As far as the sensory symptoms are concerned, these consist of spontaneous pain and other sensory disturbances, hyperesthesia and the like, and of pain on pressure in nerves and muscles. Finally, as already pointed out, both sensory and motor symptoms may be present in equal degree; sensory symptoms may predominate or alone be present; and finally motor symptoms may predominate or in turn may alone be present.

The diagnosis of multiple neuritis would seem to present little difficulty, and in ordinary practice this is the case. The peculiar character of the palsy, the involvement of the distal portions of the extremities both in pain and motion, leave no doubt as to the diagnosis. In the average case the diagnosis is easy; objective symptoms and disturbances of sensibility characterize the onset. Later there supervenes the paralysis which attacks first the distal portions of the extremities and diminishes in general from the periphery toward the trunk, the palsy always being flaccid. Finally, sooner or later there appear the trophic troubles of the muscles and the skin above described. The tendon reflexes are almost always abolished. The cutaneous reflexes may be exaggerated. The sphincters are not involved. No matter how widely multiple neuritis may be diffused, the association and succession of these symptoms suffice to make a diagnosis.

While in typical cases the diagnosis can be readily made, cases are by no means infrequent in which great difficulty may be encountered. Thus, certain cases of multiple neuritis, in which the involvement of the sensory nerve fibers predominates, as is so often the case, especially in alcoholic intoxication, may suggest at first sight tabes. The lower extremities may be the seat of sharp or darting pains, and there may be various areas of anesthesia or hypesthesia, *e.g.* plantar anesthesia. The knee-jerks are abolished, and when the patient closes his eyes the station and gait become distinctly uncertain. However, the more or less marked paralysis and atrophy of the extensors of the feet usually bring about the steppage gait. The steppage gait has nothing in common with the incoördinate gait of tabes, in which, as is well known, the patient raises his feet excessively and then brings them down forcibly upon the heels. Furthermore, in multiple neuritis,

pupilary, vesical, and genital symptoms are absent, as is also atrophy of the optic nerve. Notwithstanding, there are cases of multiple neuritis in which the sensory symptoms are almost exclusively present or in which the motor palsies are so slight that a tabes is closely simulated. Thus a multiple neuritis may begin by pains, darting in character. There may be analgesia or anesthesia of the feet and lower portion of the legs, together with abolition of the tendon reflexes. The muscular sense also may be blunted. The station may be greatly impaired, and a Romberg sign may be present. Further, especially in cases in which there is plantar anesthesia, the gait may become quite ataxic, the movements of the legs being badly coördinated, and the patient may require the constant assistance of his eyes in walking, just as in tabes. In some cases the ataxia of movement may involve also the upper extremities. The possibility of confusing multiple neuritis with true tabes is increased by the fact that in tabes itself peripheral neurites are frequent and play an important part in the causation of various motor and sensory symptoms—*i.e.*, a peripheral neurotabes may in true tabes play, as is well known, a leading rôle. We should, in doubtful cases, endeavor to establish the diagnosis of a multiple neuritis by the following features: first by the rapid development of the symptoms—at most a few weeks instead of years, as in tabes; by the absence of the Argyll-Robertson sign, by the absence of all sphincter troubles, by pain on pressure over the nerves and over the muscles, by the distribution of the sensory disturbances which are accentuated in the distal portions of the extremities and diminish progressively as the trunk is approached.

Every now and then a multiple neuritis which is diffuse and rapid in onset may strongly suggest an affection of the cord. This is especially apt to be the case when the neuritis is purely or almost purely motor. Under such circumstances a poliomyelitis may be closely simulated, so much so that the differential diagnosis may be a problem of extreme difficulty. The difficulty is further increased by the fact that both multiple neuritis and poliomyelitis may arise under similar etiological conditions, both may be acute in onset, and both may be accompanied by a febrile rise. However, there are important differences in the method of invasion which, if the case can be observed or if a clear history can be obtained, may enable a differential diagnosis to be made. Multiple neuritis begins usually in the distal portions of the lower extremities, and soon attacks the distal portions of the upper extremities; the proximal portions of the extremities are always attacked later, and this is true also of muscles of the trunk. Poliomyelitis on the other hand attacks at once both upper, both lower, or all four extremities, and the paralysis is accentuated in the portions of the limbs nearest the trunk. Sensory troubles are usually not noted; at least they do not play any but a mere subsidiary and transitory rôle, and neither the nerves nor the muscles are sensitive to pressure. In multiple neuritis again the onset is rarely as sudden and the paralysis extends more slowly. It predominates, as just stated, in the distal portions of the extremities and grows less toward the trunk, and involves the inferior extremities more than the upper. Finally, in poliomyelitis, the involvement of the muscles may be, and frequently is, decidedly irregular and asymmetrical, thus presenting a picture differing decidedly from the symmetrical palsies observed in multiple neuritis. When fibrillary contractions are observed, they argue in favor of poliomyelitis as they are very rare in multiple neuritis. Again, disturbances of the secretions of the skin and trophic disturbances of the skin argue in favor of a multiple neuritis. However, there are certain cases which from the very nature of the facts must remain in doubt; but after all it matters little if the motor neuron in the anterior cornu be attacked or its peripheral prolongation in the nerve, as far as the essential character of the symptoms is concerned; and lastly, it is extremely probable that sometimes both

nerve cell and nerve fiber are involved together.

At times a general myelitis is simulated; here, however, the involvement of the sphincters in myelitis and the preservation of the knee-jerk, as well as the absence of pain upon pressure in the nerves and muscles, serve as factors of differential value. It must be remembered, however, that some cases of multiple neuritis are incontinent because of the mental condition, the patient being deeply confused or even stuporous. Soiling of the bed, therefore, does not of itself enable us to predicate paralysis of the sphincters. Again, the knee-jerks may not be immediately lost in multiple neuritis. Finally, it is a well-admitted fact that changes in the cord may exist at the same time as changes in the peripheral nerves, and that it is perfectly possible to have in one and the same patient a certain degree of myelitis and a certain degree of neuritis. It must be admitted, however, that the combination is clinically infrequent.

A differentiation from Landry's palsy is often a matter of extreme difficulty, and in many cases the diagnosis must remain in doubt. Landry's palsy begins in the distal portions of the lower extremities, spreads rapidly to the thighs, the trunk, the upper extremities, the neck, the muscles of the face, of the larynx, and of the pharynx; no sensory involvement, no sphincter involvement, abolition of the tendon reflexes, no atrophy of muscles; death after a few days or a few weeks. In multiple neuritis, as already stated, the distal portions of the legs are involved first, then the distal portions of the arms, later only the trunk. Further, atrophy is common in multiple neuritis. Finally, in Landry's palsy, death is the most frequent outcome; in multiple neuritis it is recovery. Important as is the differential diagnosis, the task is made still more difficult by the fact that in Landry's palsy there is not rarely an actual involvement of the peripheral nerves.

Treatment.—In all forms of multiple neuritis, whatever the origin, absolute rest in bed is imperative. In most cases, indeed, the loss of power in the limbs is so pronounced that the patient is already in bed when the physician arrives. In other cases the patient, not knowing the seriousness of his condition, may remain up and around unless advised to the contrary. Absolute rest in bed, let us repeat, is imperative. The limbs should be so placed as to be neither excessively flexed nor unduly extended, and should be supported upon soft pillows, or better still, if they be very painful, upon cotton-batting kept in position by flannel bandages or by splints. In other cases flannel bandages alone, if not too firmly applied, give considerable comfort. As a rule attention to the position and proper support of the limbs is of itself sufficient to greatly relieve the pain. At times, however, it is imperative to make use of the coal-tar analgesics or even of morphia. Not infrequently a combination of morphia and phenacetin yields an excellent result. For reasons which are of course evident, these drugs should be used for a short time only and as sparingly as possible.

The pain having been brought under control, the cause of the attack should be sought for. If the latter be clearly toxic—*e.g.*, alcoholic in origin—the removal of the cause constitutes the next step in treatment. In cases of alcoholic multiple neuritis, which is the most common form, the alcohol should of course be withdrawn immediately.

If a diathetic cause seems probable, such as rheumatism, appropriate treatment should be adopted. In most cases, indeed, it is well to begin the treatment by the free administration of diaphoretics, such as neutral mixture. By this means the elimination of such alcohol as is still present in the economy, or of uric acid or other toxic substances, is greatly favored. The free ingestion of liquids also favors free diuresis, and the advantages of this need hardly be dwelt upon. When the initial stage has subsided it is advantageous to make free use of salicylic acid and its compounds. Independently of their beneficial action in cases of

neuritis due to cold—that is, "rheumatic" neuritis—they are indisputably of benefit in other forms. The drug should be administered in such a way as to be least irritable to the stomach. In alcoholic patients this point is of paramount importance. Neutral solutions of ammonium salicylate, especially if the solution is absolutely neutral, are as a rule better borne than sodium salicylate, but no matter which drug be employed it should be given largely diluted, and if possible after the taking of food. Aspirin is of undoubted value and is applicable to a larger number of cases than either sodium salicylate or ammonium salicylate. It should be given in from five to fifteen grains every four hours. In some cases it will disagree with the stomach, and then recourse should be had to salophen, which should be given in similar doses. Though very bland and always agreeing with the stomach, salophen is less efficient than aspirin.

A treatment such as this should be persisted in for a more or less prolonged period —for several days, and even, with proper precautions, for a week or two. Because of the great weakness attending the usual attack of multiple neuritis the heart should be carefully watched, and, especially during the administration of the salicylate remedies, it is often wise to give digitalis, preferably in the form now dispensed as digitalone. After the salicylates are discontinued, lycetol or piperazin should be freely given, preferably lycetol in fifteen-grain doses daily, dissolved in large quantities of water.

In cases of average severity, more or less marked symptoms of weakness in the extremities, pain, and hyperesthesia persist, in spite of active treatment, for weeks and sometimes months. In other words, the average case passes into a subacute or chronic stage. At this period it is useless to longer administer the salicylates or piperazin. Advantage is now found to result from the administration of moderate doses of mercuric chloride, 1/30 of a grain, or of potassium iodide, from 5 to 15 grains three times daily, or of both of these drugs together. I have had an especially favorable experience with long-continued administration of small doses of the mercurial.

As might be expected, the patient suffers more or less marked loss of weight during this prolonged illness and often becomes very anemic. To combat these conditions, iron, especially in the form of the tincture of the chloride, cod-liver oil, malt, and other nutrients are indicated. As time passes the tincture of ferric chloride should be replaced by milder chalybeates, such as Blaud's pill or iron and manganese peptonates. Strychnine and arsenic in small doses may also be employed under these conditions, although their value is open to some question.

During the entire course of treatment the principles of the "rest-cure" should, so far as possible, be applied—that is, full feeding should be resorted to, milk and eggs being added to the diet in large and increasing quantities; and as the pain and hyperesthesia subside, massage should be employed. Later on, when nothing but muscular weakness remains, electricity should be used. The slowly interrupted faradic current is indicated in most cases, and the extensor muscles should receive especial attention.

In many cases there is, in addition to the residual weakness, more or less marked contracture of the limbs. This can as a rule be overcome by passive movements and massage, provided these measures be persisted in for a sufficiently long period. It is important also in certain cases, when the patient begins to exercise, to correct foot-drop, when persistent, by a leather or rubber muscle or by other orthopedic device. It is remarkable how great a degree of improvement it is possible to obtain in even very bad cases; indeed, a complete cure is by no means infrequent when the outlook is at first and for a time persistently discouraging.

CHOLEMIA IN NEURASTHENIA.

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The toxicity of bilirubin has not been the subject of much investigation. According to Bouchard, about two-thirds of the toxicity of bile is due to this cause, pointing to the possibility of a bilirubinemia producing definite symptoms such as are found in those diseases in which this condition exists. Further, there may be definite disease in which the primary pathological condition is the presence of an excess of bilirubin in the blood.

Bilirubin has the composition $C_{32}H_{36}N_4O_6$, behaving like an acid, forming soluble compounds with metals of the potassium group. The amount of bilirubin in bile from the gall-bladder is about 5 per cent, while in the bile from a fistula it is about 0.1 per cent. The formation of bilirubin in twenty-four hours, though variable, will probably never exceed 5.0 grammes under normal conditions. Bilirubin is almost certainly a decomposition product of hemoglobin, though the chemic constitution in the various stages of formation is not known. Croftan has produced bilirubin by the action of trypsin on hemoglobin in the presence of glycogen or glucose. Bilirubin is produced by nascent hydrogen, also probably by bacteria in the intestine into hydrobilirubin, which is further reduced to stercobilin, in which form it is eliminated with the feces. A certain proportion of the hydrobilirubin is absorbed from the intestine and eliminated from the kidneys, with further reduction to urobilin. Our present knowledge of these processes is very limited, but that urobilin is derived from bilirubin is almost certain.

The toxicity of bilirubin has not yet been proved by experiments on animals. Bouchard states that 6.0 Cc. of bile per kilogramme of animal causes death in convulsions, and that if the bile is filtered through animal charcoal, removing the coloring matter, its toxicity is reduced two-thirds. This reduction in toxicity cannot be caused by the absence of bilirubin, as injections of pure bilirubin have in the experiments of R. Plaesterer produced little or no toxic effect. David Rywosch obtained slight disturbances immediately after the injection, the animals recovering in a few hours. The conditions existing in cholemia are very different from those produced by the injection of the pure substance in healthy animals; in the latter condition the bilirubin is partially reduced to hydrobilirubin and eliminated by the kidneys, but principally it is precipitated into the tissues, and thus withdrawn from the circulation. In order to produce the toxic effects of cholemia it would be necessary to inject daily or more often a certain amount of bilirubin until the tissues become discolored and failed to absorb a further quantity.

Rene Frison has shown that injections of bilirubin produce a hyperexcitability of the muscles to electric stimulation which is antagonistic to the action of the bile salts, injections of the latter producing hypoexcitability to electric stimulation (small doses of the bile salts produce hyperexcitability). These experiments show that bilirubin is toxic, and that the failure of elimination with saturation of the tissues will produce a toxemia with hyperexcitability of the muscles, simulating the condition known as "nervousness."

The pathologic condition producing cholemia is due either to increased formation of bilirubin with failure of elimination, or to pathologic conditions in the liver causing the bilirubin to be absorbed instead of being eliminated with the bile into the intestine. Plugging of the bile capillaries, cirrhosis of the liver, and cellular insufficiency are probable causes. The pigmentation of the skin renders the diagnosis of cholemia very easy. The bile pigment

is usually absent from the urine, or is only occasionally present, or there may be an excess of urobilin.

The qualitative examination of the blood for bilirubin is not difficult; the finger of the patient is punctured, and about 2 Cc. or 3 Cc. of blood allowed to drop into a clean, dry cylinder, which is placed in a cool place for twenty-four hours without shaking and allowed to clot, the serum drawn off, and Gmelin's test applied. The albumin immediately clots from the action of the acid, but in a few minutes a slight blue ring appears just above the point of contact. Gmelin's reaction to bilirubin is positive in dilutions of 1 to 40,000; according to Hayem the reaction is positive in normal serum; if the serum is diluted with two-thirds normal salt solution and the reaction is positive, cholemia exists. The clinical symptoms of cholemia are sufficiently marked to render the laboratory examination unnecessary except for the purpose of confirmation.

The patients usually complain of nervousness, with a feeling of fatigue, inability to work, with a nervous irritability accompanied by a despondency which may be so great as to become a delusional melancholia. The patient also complains of a form of dyspepsia which he describes as "bad digestion," characterized by a feeling of heaviness in the stomach after eating, followed in an hour or two by thirst, with acid eructations; there may be pains in the region of the stomach immediately after eating, which cease after a few minutes, reappearing in three or four hours, and feeling as though they were moving toward the esophagus. There may also be sick stomach, but rarely any vomiting. The appetite remains normal, or may be capricious and exaggerated, rarely decreased, occasionally a true anorexia occurs. It must be borne in mind that a patient's account of what he eats is not reliable; the only way of finding out the condition of his appetite is to test the 24-hour urine for total nitrogen. Constipation is a marked symptom, often with occasional attacks of diarrhea without apparent cause, the stools being acid and burning, containing much bile, and perhaps blood and mucus; the diarrhea may commence with vomiting of bile. The stomach examination shows hyperchlorhydria with excess of organic acids, occasionally hypochlorhydria. The stomach contents are thick and viscid, there being a lack of fluid, and much very acid mucus. There is also excessive gas formation. Digestion appears to be rapid and complete.

The pulse is normal or slow, irregular and irritable; the mean blood-pressure is high in proportion to the maximum. There is a hyperacidity of the saliva, with a bitter taste in the mouth and a fetid breath. A common symptom is a reversal of temperature, the maximum being at 7 A.M., and the minimum, which may be slightly below normal, at 7 P.M.; there may also be subjective temperature, and rarely slight intermittent feverishness. Epistaxis is common, hematemesis rare, retinal hemorrhage may occur in old patients, purpura on the back of the hands is common, cerebral hemorrhage is not uncommon, menorrhagia is the rule.

The skin has a dirty, yellowish hue, generally termed "bilious complexion." The discoloration is most marked on the back of the hands and dorsum of the foot; the skin over the knuckles may be of a normal shade or nearly so, while the skin between the joints is pigmented, varying from a dirty yellow to a dark brown; spots may also occur on the palm of the hand, soles of the feet, on the tibia, on the face, and various parts of the body. The whole skin is discolored, with deeper coloration in patches in various parts.

The mental symptoms differ in each case and are of no value from a diagnostic standpoint. The prevailing condition is that of melancholia, a deep despondency, looking on the gloomy side of everything, exaggerating every trifle, a fear of some undefined danger, with a desire for death, which may, though rarely, cause suicide. "Hearing voices" is also common; the patient may jump from the window to get away from the persecution, but without suicidal intent. From the worry and de-

pression there is a loss of weight, insomnia, and headache, the latter being usually at the vertex or occiput. The mental symptoms develop slowly and insidiously, progressing to insanity.

Physical examination gives little information; the liver may be slightly decreased in size and the spleen enlarged, but these conditions are not constant. The etiology of the condition is not very clear; if it is conceded that bilirubin is only formed in the liver, then an imperfect elimination of bile must be the cause, and in a large number of cases this is undoubtedly the cause. The question whether bilirubin can be formed in other organs is not settled, though it is found in old blood-clots and in the pigmented areas of the skin. A certain number of cases appear to be congenital, due probably to the action of maternal toxins upon the liver of the fetus.

In the newly-born there is a physiologic cholemia, bilirubin or urobilin being found in large amounts in the plasma. Gilbert and Lereboullet have shown that under normal conditions the blood of the umbilical cord contains three times as much bilirubin as the maternal, and that the blood of the newly-born is a third richer in bile pigment than the blood in the cord; this physiologic fetal cholemia must produce a slight secondary cholemia in the mother. The urine of the newly-born contains no bilirubin under normal conditions, and its presence denotes a pathologic cholemic condition.

In most cases there is a history of chronic constipation antedating the dyspeptic symptoms; the toxemia from the constipation and from the organic acids formed in the stomach is probably the cause of the hepatic insufficiency, which affects the bile capillaries, preventing free elimination of the bile, forcing it into the lymphatics; a portion of the liver may only be affected. Boix, Welch, and Fridenwald have shown that the products of gastric fermentation produce cirrhosis of the liver; a slight angiocholitis from a weak infection may also be a cause. The glycosuric functions of the liver are usually normal, or nearly so.

Interstitial nephritis is often associated with this condition; the cholemia may be due to the incapacity of the kidney to eliminate the excess of bilirubin in the blood, but, what is more probable, the presence of an excess of bilirubin in the blood produces the kidney lesion. The excessive formation of bilirubin and the decreased destruction of erythrocytes are a cause of the pigmented skin in some cases of anemia, and especially in malaria and other infections, but in the cases under consideration there is no very marked anemia, though occasionally I have found methemoglobin.

In many cases Gmelin's test has been found to be positive in the cerebrospinal fluid, in which bilirubin is normally absent. As the cerebrospinal fluid is a special secretion from the ependyma of the ventricles, the vessels of the pia, and the choroid plexus, following the perineural sheaths, some escaping from the neural lymphatics, the largest portion finding its exit from the cranium into the longitudinal sinus, acting as a lymph for the nervous system, it is probable that should bilirubin obtain entrance into this special circulation nervous symptoms would result.

The cases of neurasthenia or insanity associated with, and in my opinion caused by, cholemia are difficult to treat. Mercury in small doses in combination with sodium glycocholate mass has a good effect upon the liver; at the same time the patient should drink large quantities of water containing the inorganic salts of the blood in their normal proportions, to which may be added high injections of artificial serum. The alkalies in full doses are also of benefit, as is also sodium salicylate.

The administration of hepatic stimulants is usually followed by marked physical improvement, the sodium glycocholate mass assisting to clear up the discoloration of the skin. The discoloration of the skin is a barometer for the condition, the shade deepening usually a day or two before a relapse. In a typical case at Mount Hope Retreat the patient became of a deep brown color a few days before a severe delusional attack occurred, and as the color of the skin improved so did the mental symptoms.

ACTION OF SEVERAL AGENTS UPON INTESTINAL PERISTALSIS, STRIPED MUSCLE, AND THE HEART.

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AND
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Demonstrator of Physiology.

The intestinal movements were studied by the method of Magnus, of Heidelberg. Our experiments were made by taking a piece of the small intestine, about 10 centimeters in length, of a rabbit or cat. This was placed vertically in a glass containing 225 Cc. of a modified Ringer solution. One end of the intestine was connected by a hook to an L-shaped glass tube, and the other end was fastened by a thread to a hook on Porter's heart lever slightly weighted. The piece of intestine was entirely immersed in the solution, through which oxygen was constantly bubbling. The temperature of the Ringer solution was maintained at about 37° C. The cardiac lever registered the contractions of the longitudinal muscles of the intestine upon a smoked drum. Several contractions of the intestine were recorded for a few minutes before the agent to be used in the experiment was poured into the Ringer solution surrounding the intestine. The subsequent contractions of the intestine were studied as affected by the drug.

The heart of the frog with the sinus snipped was allowed to register for five minutes. Then the agents in tap-water saline were painted on the heart and the effects noted.

The gastrocnemius of the frog was removed and allowed to soak in tap-water saline with the agent added from ten to fifteen minutes. Then weak opening induction shocks were applied to it, and the curve was taken on a smoked drum.

The point observed in the muscle curve was whether any of these agents produced a prolongation of relaxation in the muscle curve, as has been noted after veratria and adrenalin. The height of the contraction was not studied, and when I speak of the effect or no effect on the muscle curve I refer only to the prolongation or no prolongation of the relaxation period.

Skatol (Merck).—When a half-grain of skatol was thrown into the Ringer solution the height of the peristaltic contraction

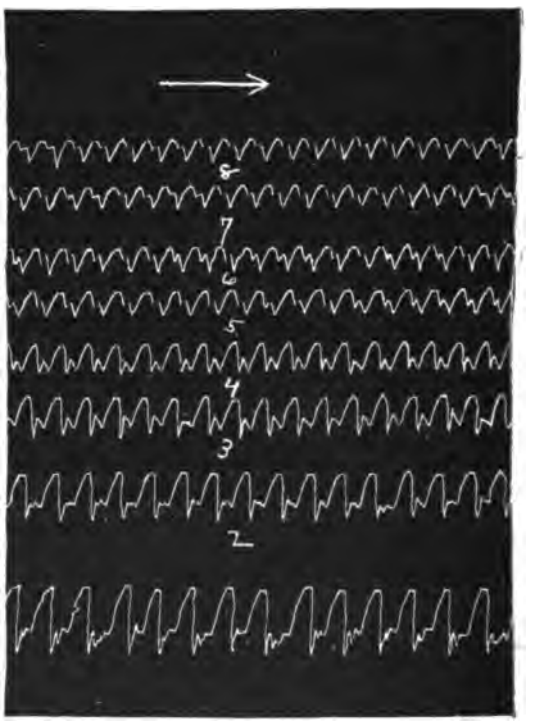

FIG. 1.—Effect of skatol on heart. First line normal. Subsequent lines show the effect of skatol locally applied to the heart.

was greatly increased for a short period. The tonus of the intestine was slightly increased and then decreased.

Skatol had no effect upon the curve of relaxation of muscle.

Skatol increases the frequency of the frog's heart, but reduces its force (Fig. 1).

Indol (Merck).—It lowers the tonus, but

does not affect the strength of the intestinal contractions. It lowers the force and frequency of the heart (Fig. 2).

The relaxation period of the muscle was not altered by it.

Neurin (*Merck*).—One-half drop of a 25-per-cent solution lowers the tonus and force of peristalsis.

It lowers the force and frequency of the frog's heart. The relaxation period of the muscle was not affected.

It did not prolong the relaxation of the muscle curve.

Butyric Acid (*Merck*).—One drop of a 25-per-cent solution increases the tonus and force of the intestine.

It slows the heart and arrests its diastole.

It causes no change in the relaxation period of the muscle.

Uric Acid (*Merck*).—Uric acid in two-gramme doses when added to the Ringer's solution increased the height of the in-

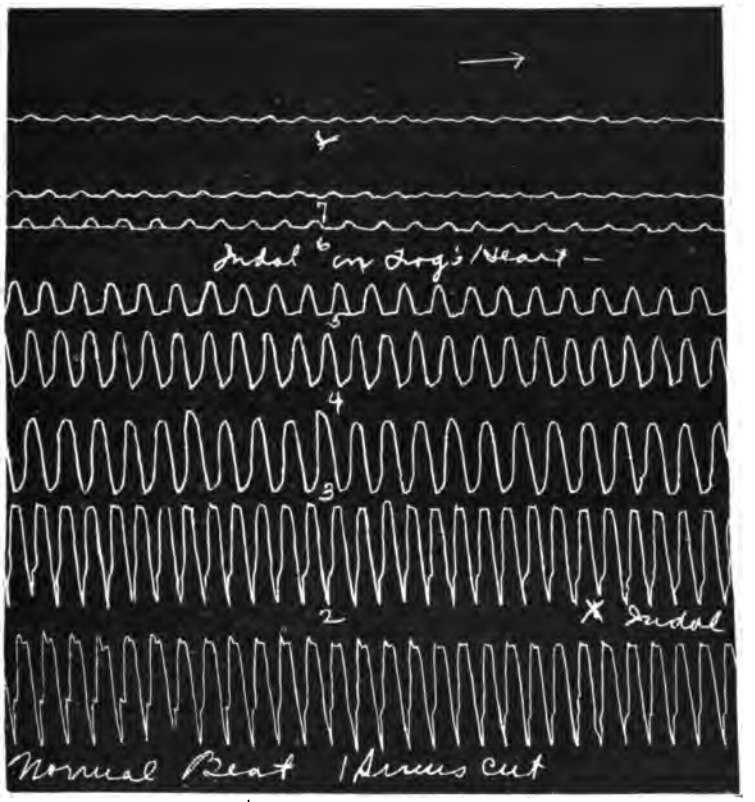

FIG. 2.—Effect of indol on frog's heart. First line normal. Subsequent lines show the effect of indol.

Cholin (*Merck*).—It temporarily stops the heart. Cholin has no effect upon the relaxation of the muscle curve.

Upon the intestine it primarily increases the force and tonus; then decreases the height of the intestinal contraction and the tonus.

Glycocholic Acid (*Merck*).—It did not alter the rate of the heart-beat, but lowered the height of the contraction.

It decreased the tonus and force of the peristaltic movement of the intestine.

testinal contractions, but caused no change in the tonus (Fig. 3).

Uric acid occasionally prolonged the relaxation of the striped muscle.

Uric acid reduced the force and frequency of the frog's heart.

Hippuric Acid (*Merck*).—Hippuric acid increased the tonus of the intestinal muscle, but had no effect on the height of the contraction.

Hippuric acid had no effect in prolonging the relaxation of the muscle curve.

Upon the heart hippuric acid did not alter the rate, but reduced the height of the contraction.

Xanthin (*Merck*).—It slowed the heart, momentarily stopping it (Fig. 4).

It altered the relaxation period of the muscle (Fig. 5).

Urea (*Merck*).—Urea causes slow relaxation of the muscle (Fig. 6).

Urea reduces the force of the heart, but does not alter its rate.

It very slightly increases the force of the intestinal contractions.

Abrin (*Merck*).—One one-hundredth of

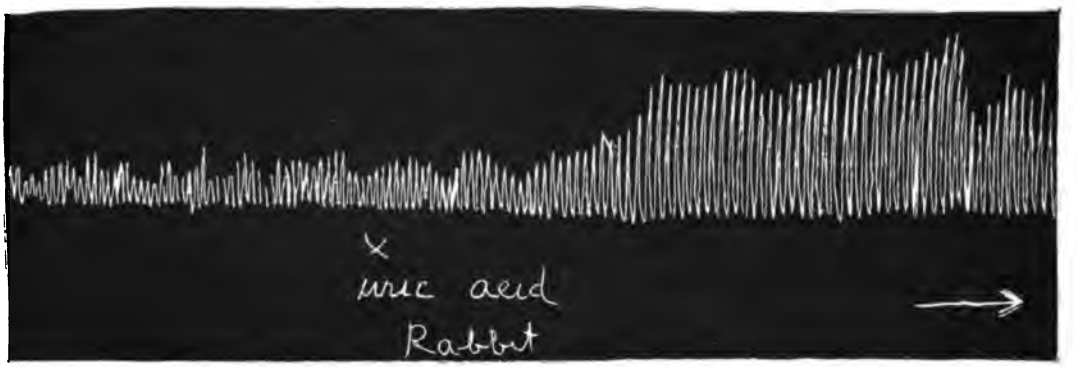

Fig. 3.—Effect of uric acid on intestinal movements.

It lowered the tonus, but increased considerably the force of intestinal contraction.

Hypoxanthin (*Merck*).—It reduces the height of the cardiac contractions.

It has no effect upon the relaxation of the muscle curve.

a drop increases the tonus and force of the intestine.

Abrin lowers the force of cardiac contraction and slows the rate very slightly.

It does not alter the relaxation period of the muscle.

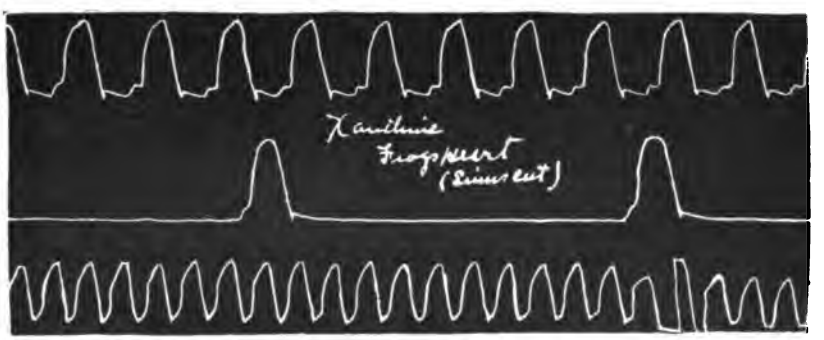

Fig. 4.—Effect of xanthin on the frog's heart. First line normal. Second line shows arrest. Third line shows the slowing action on the heart.

It reduces the tonus, but increases the force of the contraction of the intestine.

Guanin (*Merck*).—It lowers the tonus, and but slightly increases the force of peristalsis.

It has no effect upon the relaxation period of the muscle.

It has no marked effect upon the heart.

Iodothyrin (*Merck*).—Iodothyrin increases the tonus, but reduces the strength of intestinal contractions.

Iodothyrin reduces the force of cardiac contractions.

It has no effect upon the relaxation of the muscle.

Protonuclein (*Reed & Carnrick*).—Nu-

clein in large doses (8 grains) when added to Ringer's solution produced a temporary inhibition of the intestinal movements, followed by an increase in tonus and in the extent of the contraction.

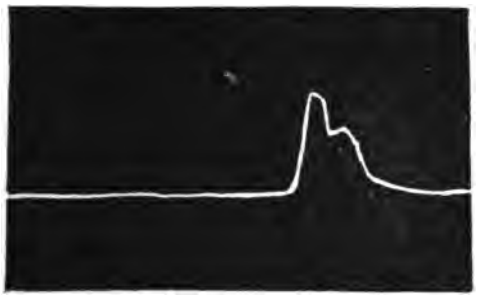

FIG. 5.—Effect of xanthin on the muscle curve of the gastrocnemius of the frog.

Protonuclein had no effect on the relaxation period of the muscle curve.

Protonuclein lowered the force and frequency of the frog's heart.

Spermin (*Poehl*).—Spermin increased the height of the peristaltic movement, but lowered the tonus.

Upon the heart-beat it lowered the

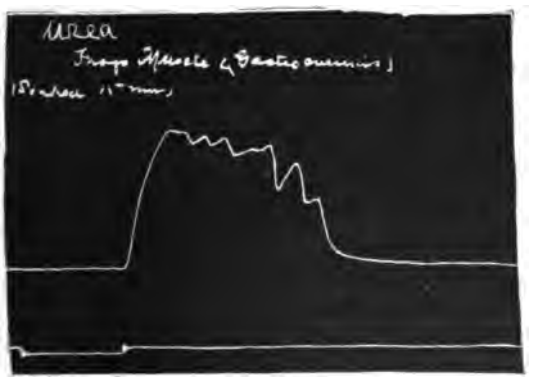

FIG. 6.—Effect of urea on muscle curve of frog's gastrocnemius. Weak opening induction shock.

height of the contraction, but did not alter its rate.

It had no effect upon the relaxation of the muscle curve.

Picrotoxin (*Merck*).—It reduced the tonus, but very slightly increased the force of peristalsis.

It greatly lowered the force of the cardiac contractions, but did not affect the frequency of the heart.

It did not alter the relaxation period of the muscle.

In a previous paper[1] we have shown that the albumoses, peptones, leucin, and tyrosin increase intestinal peristalsis. Roger[2] has confirmed the action of peptone. Of these agents, the albumoses seem to be the most powerful. The other agents found in the intestinal canal, as skatol, indol, neurin, cholin, and butyric acid, also increased peristaltic movements. Hence we can infer that nearly all the products of intestinal digestion and putrefaction have the power to coöperate in an evacuation of the intestinal contents. Of all these agents, albumoses are the most active. Hence a thorough digestion producing albumoses is essential in the unloading of the intestinal contents.

As to uric acid, hippuric acid, xanthin, hypoxanthin, guanin, and urea, all increased the activity of the intestinal movements. Abrin, protonuclein, and spermin increased the extent of the intestinal contractions.

These studies show that the intestinal unstriped fibers and ganglia are very sensitive to a great variety of agents, and whilst some only increase the tonus, others increase the height of contraction and the tonus. As to inhibitory agents of the intestinal canal, the chief one is adrenalin, and in man opium.

The agents which excite peristalsis greatly preponderate when compared with those inhibiting.

As to changes in the relaxation period of a muscle curve, xanthin, uric acid, and urea slow it. Urea and xanthin make the striated muscle more irritable.

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[1] *Journal of the American Medical Association*, 1905.

[2] *Journal de Physiologie et de Pathologie Generale*, 1906, No. 1.

A REVIEW OF THE OPSONINS AND BACTERIAL VACCINES.

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As requested by the GAZETTE, I shall attempt to describe as succinctly as possible the theory of the opsonins and the therapeutic results that have been obtained by the application of the new theory. As the years go by we realize more thoroughly the correctness of the prophetic belief of the "Immortal Pasteur," that the day would come when it would be possible to eradicate the infectious diseases by vaccination.

We are indebted to Metchnikoff for calling attention to and explaining the rôle of the white blood cells in the defense of the body against bacterial invasion, but the phenomenon of phagocytosis is not so simple as it at first appeared, as little by little new facts are developed which amplify our knowledge of the subject.

It was shown by Denys and Leclef, in 1895, that when rabbits were immunized against streptococcus pyogenes the serum acquired but slight bactericidal properties, but that such serum, when brought in contact with the leucocytes of normal or immunized rabbits, greatly enhanced their phagocytic activity. Conversely no acceleration of phagocytosis was observed when the corpuscles were brought in contact with the serum of a normal animal.

Mennes two years later confirmed this by showing that similar results were obtained from the blood serum of guinea-pigs treated with cultures or toxins of pneumococci.

A method of measuring the phagocytic activity of the leucocytes was developed by Leishman in 1902. In 1903 Wright and Douglas made an extensive study of the phagocytes, when brought in contact with suspensions of cultures of staphylococcus pyogenes, and were able to show:

1. Quoting from the original: "We have here conclusive proof that the blood fluids modify the bacteria in a manner which renders them a ready prey to the phagocytes. We may speak of this as an 'opsonic' effect (*opsono* (a Latin verb), I cater for; I prepare victuals for), and we may employ the term 'opsonins' to designate the elements in the blood fluids which produce this effect."

2. Normal blood serum and plasma possess the same opsonic action upon bacteria.

3. Serum loses its opsonic action when heated to 60° C. This is spoken of as inactivated serum.

4. Inactivated serum and physiological salt solution have the same influence upon phagocytosis.

5. "The opsonic power of the blood fluids disappears gradually on standing," losing about 50 per cent of its activity in five or six days.

6. An anti-opsonic effect is noted when blood serum is digested with typhoid bacilli.

7. When a condition of immunity is conferred upon patients infected by staphylococci, by vaccination with heated cultures of staphylococci, the opsonic action of the patient's blood serum is greatly augmented.

Neufeld and Rimpau (1904) found in antistreptococcic and pneumococcic sera evidence of substances which, while inactive toward leucocytes, possessed very marked opsonic or sensitizing action, as they termed it, toward corresponding cultures of streptococci and pneumococci.

Ross (*Lancet*, November, 1906) summarizes our knowledge of the opsonins as follows:

"1. Opsonins act by chemically uniting with the invading bacteria, and so altering them that the leucocytes are able to phagocyte the bacteria and destroy them. It is important to remember that these substances do not stimulate or otherwise affect the leucocytes.

"2. It is probable that there are present many varieties of opsonins in the blood plasma, each having to do with combating a particular kind of microbic invasion.

"3. Opsonins have been shown to be distinct from other bacteriotropic substances,

such as the bacteriolysins, the agglutinins, and the antitoxins."

The leucocytes of healthy or diseased persons seem to be equally active when brought in contact with the same serum, hence the amount of opsonins present in the blood of an individual determines, according to the opsonic theory, his susceptibility to bacterial invasion.

TECHNIQUE.

To measure the resistance of the patient to such invasion, or to find out his opsonic index, special technique has been developed, which may be briefly described as follows:

I. EMULSIONS OF BACTERIA.

Twenty-four-hour or younger growths of the rapid-growing bacteria, as staphylococci, streptococci, pneumococci, gonococci, and colon bacilli, upon inclined agar are washed off with normal saline solution. After the mixture has sedimented, the upper, whitish layer composed of fluid and bacteria is removed with a pipette, and the finer clumps of bacteria precipitated by placing the fluid in a rapidly rotated centrifuge for a few minutes. The supernatant layer, which is still opalescent and is called a bacterial emulsion, should if suitable for work contain the germs in a well-separated condition.

Cultures of tubercle germs are heated, and ground in a mortar with salt solution until the mass is well broken up, and then centrifugated. In case glycerin cultures are used, such as are left in the manufacture of Koch's old tuberculin, the glycerin must be removed by repeated washing with water and finally with 1.5-per-cent salt solution. The washed culture is worked up in a mortar and centrifugated until the clumps are practically all thrown down, and the cloudy layer or emulsion is removed.

The emulsions must be of uniform density. Wright computed the number of germs in a given volume by counting, but McFarland and L'Engle devised an apparatus which is called a nephelometer, consisting essentially of mixtures of $BaSO_4$, put up in sealed tubes, which correspond to solutions containing from 1 to 10 per cent of $BaCl_2$, which serve as standards. The turbidity of the emulsion is compared in similar layer with the standard tubes of $BaSO_4$. They found that the tube containing "5 per cent of $BaCl_2$ corresponds to the most useful bacterial suspension." The permanency of the emulsions varies a good deal. Suspensions of the gonococci should be used at once, staphylococci within two days, etc., while the emulsion of tubercle germs may be employed indefinitely.

II. WASHED WHITE BLOOD-CORPUSCLES.

The finger or lobe of the ear is punctured as in making a blood count, and the blood is allowed to drop directly into normal saline, .85-per-cent solution, containing about 1 per cent sodium citrate; this decalcifies the blood and prevents clotting. The corpuscles are completely precipitated in the centrifuge, and then repeatedly washed with .85 per cent saline and centrifugated, until all traces of the citrate and serum are removed. After the final precipitation the saline solution is withdrawn, and the thin upper grayish layer of the sediment, the leucocytic cream, consisting for the most part of washed white blood cells, is removed.

III. THE SERUM.

Blood is obtained in the usual way, but is collected in small, bent, glass tubes, which can be readily held in the centrifuge and the serum separated. In obtaining normal serum, care must be exercised in selecting a healthy subject, or, what is better, obtain serum from the mixed blood of several normal persons' "Pool."

IV. STAIN.

With the exception of Malta fever and tubercle bacilli, Leishman's stain, consisting of eosin and methylene blue, in combination, or Jenner's stain, is employed. Carbol-fuchsin is employed for the tubercle bacilli.

METHOD OF OBTAINING OPSONIC INDEX.

Special capillary pipettes, graduated into equal divisions, are required; then by means of a rubber tube or bulb equal quantities of

washed corpuscles, bacterial emulsion, and patient's serum are taken up, and all blown out upon a glass slide and thoroughly mixed. The mixture is then drawn up in a small pipette, sealed, and placed in an incubator of the ordinary type, or preferably in an opsonic incubator as proposed by Freeman; it is heated to 37° to 40° C. for fifteen minutes. A similar tube is prepared, except that the normal serum or "Pool" is employed instead of the patient's serum. At the end of fifteen minutes the smears on microscopical slides are made from each tube, fixed, and stained. A good field is selected, one containing many leucocytes, the number of germs counted in the first fifty or hundred observed, and an average per leucocyte determined. If the average in the mixture containing the normal serum is two, we would say that the normal opsonic index is two, and if the mixture containing the patient's blood serum is one per corpuscle, we would say that his index was one-half, etc.

Wright and his pupils, as the result of numerous observations, classify diseases due to bacterial infections:

1. "Diseases in which the bacterial process is strictly localized" or "shut off from the lymph and blood circulations." Furunculosis, lupus, tuberculosis, etc., in fact most chronic infections, belong to this class. "In this class the opsonic index of the blood is persistently below normal, owing to the absence of immunizing stimuli."

2. "Diseases in which the bacterial process is but loosely shut off, especially from the lymph circulation." In these, usually acute, infections immunizing products from the invading bacteria from time to time get into the circulation, and the opsonic index may be normal or above or below normal. Good examples of this class are tuberculous joints, etc.

3. "Diseases in which the bacterial infection is in the blood stream." In this class belong acute infectious diseases, septicemia, endocarditis, Malta fever, etc. In these "the opsonic index is generally below normal."

Wright and Douglas lay down the following general principles for treating cases of bacterial infections:

1. "Isolate in pure culture the causative microörganism."

2. "Estimate the opsonic power of the patient's blood to this microörganism."

3. "If the opsonic index be at or below normal, prepare and standardize a vaccine from this microörganism."

4. "Inoculate the patient with this vaccine with appropriate doses and at proper intervals, as shown by a systematic estimation of the opsonic content of the patient's blood."

PREPARATION OF VACCINES.

The vaccines, with the exception of the tubercle vaccine, consist of emulsions of heated cultures of the particular germ producing the infection. Luxuriant cultures of the desired organism are grown upon inclined agar; the growth is then removed with salt solution and a glass rod, and thoroughly emulsified by shaking in a test-tube, in order to get the germs well distributed and the clumps broken up. The number of germs in a given quantity of the emulsion is then determined by comparing the number of germs and red blood-corpuscles in a mixture of one part emulsion, one part freshly drawn blood, and three parts of normal salt solution. If there are ten times as many germs as blood-corpuscles, the bacterial suspension contains approximately 45,000,000 germs per cubic centimeter. The number of germs present will of course vary with the density of the emulsion. The bacterial suspension is heated at the lowest temperature and for the shortest possible time to kill it. The amount of sterilization will differ with different organisms; 60° C. or less maintained for thirty minutes or less is usually sufficient. Cultures from the vaccine are finally made to insure that it is sterile and safe and some preservative added.

Tubercle Vaccine.—This is the "New Tuberculin Koch," an opalescent fluid, containing the active principle of tubercle bacilli obtained according to the method of Koch.

THERAPEUTIC APPLICATION.

After a proper diagnosis has been made, the patient's opsonic index taken, and the appropriate vaccine prepared, the patient receives his initial injection of several hundred millions more or less of the heated bacteria, and his opsonic index is watched. A short time after the inoculation is made the opsonic index falls lower than it was previous to the injection. This Wright has named the "negative phase." Sooner or later, from a few hours to several days, the opsonic index rises above the starting-point. This is called the "positive phase." The amount of the opsonins in the blood remains stationary for a variable length of time, and then diminishes. As soon as their diminution is noted, a second injection of the vaccine is given, which is followed by a negative phase, but less pronounced than before. Soon the positive phase comes on, reaching a higher level than previously. Thus the injections are repeated from time to time according to the opsonic index of the patient's blood, and the positive phase gradually attains a higher and higher level, until it may be as high as or considerably higher than that of a normal person. In other words, if the vaccinations are properly given, "never during a negative phase," and as a result the patient's tissues are stimulated to an increased production of the opsonins, phagocytosis is increased, the invading bacteria are disposed of, and the patient recovers from his infection. The proper handling of patients according to this method requires the greatest attention to details of technique for obtaining the opsonic index, preparing the vaccine, and the administration of the proper dose at the proper time.

It is too early to know the ultimate results that may be expected from the use of the vaccines, but from personal observation, conversation with other workers, and numerous reports, most of which are incomplete, it seems reasonable to believe that for localized bacterial infections much may be accomplished. Especially does this seem probable for acne, furunculosis, sycosis, abscesses, and lupus, adenitis, and other similar tubercular infections.

In incipient pulmonary tuberculosis encouraging results have been obtained where minute doses of new tuberculin, 1/1000 of a milligramme more or less, have been given, which seemingly show that Koch's original observations were well grounded in fact.

Something has been accomplished in those diseases in which the bacterial infection is in the blood stream.

After a careful consideration of the literature of the entire subject I believe we should recognize the new therapy as an experimental procedure of much promise, but until more extended observations have been made the use of the vaccines should not be looked upon as a settled method of treatment.

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THE EXTERNAL USE OF ALCOHOL IN SURGERY.

Alcohol is used by RAPHAEL (*Therapeutische Monatshefte*, No. 9, 1906) both on open wounds and as a counterirritant on the unbroken skin.

He has had good results from the application of compresses to the abdomen in localized peritonitis, notably two cases of typhoid perforation. Ninety-per-cent alcohol is poured on compresses, which are placed on the abdomen and covered with oiled silk. When it becomes dry the silk is raised, and more alcohol is poured on. Cases of mastitis and phlegmons of the fingers were treated in the same way. Infected wounds are washed with strong alcohol and a compress soaked in the same applied. Eczema and erysipelas are also favorably influenced. In cases of puerperal endometritis the womb is washed out, first with 50-per-cent alcohol, and if this is well borne, with 90-per-cent, and a tampon soaked in alcohol is laid in the vagina. A compress is also placed on the abdomen. All cases handled in this way have resulted in prompt recovery. Its action is not due to bactericidal properties.

EDITORIAL.

THE ORAL ADMINISTRATION OF ANTITOXIN.

The advantages which surround the oral administration of antitoxin in the treatment of diphtheria and tetanus, the two diseases in which antitoxin treatment has so far proved itself advantageous, are so numerous and great as to be manifest even to the lay mind, since it cannot be denied that the natural way of introducing substances into the body for effect upon the organism is by the mouth, and that hypodermic injection is possessed of some danger. Further than this, the necessity of preparing antitoxin in such a way that it can be given by the hypodermic syringe adds so greatly to the cost as to prove a serious obstacle to the free use of these valuable therapeutic agents. On the other hand, the few clinicians who have attempted to treat diphtheria and tetanus by the administration of antitoxin by the mouth have rarely obtained sufficiently satisfactory results to make them inclined to repeat the procedure or to recommend it to their less venturesome comrades.

We note with much interest a valuable original research by McClintock and King which is published in the *Journal of Infectious Diseases* of October 30, 1906, their investigations being made upon animals and men. They find that the administration of antitoxin by the mouth cannot be relied upon to produce results which correspond in value to those which follow its hypodermic use, but they also find that antitoxin is absorbed as such from the stomach, and aids the body materially in combating the infection. A very interesting part of their research is their ability to show that diphtheria and tetanus antitoxin when mixed with trikresol, salol, chloroform and opium are much more effective when they are taken upon an empty stomach, in which the digestive function has been diminished by the simultaneous administration of some drug, than when they are administered to a stomach which is in an active state. In other words, if the digestive juices are present in large quantity they act deleteriously upon the antitoxic substances, and therefore it is important to see, first, that the antitoxin is administered by the mouth during a period of starvation, and second, that several hours must be allowed to elapse for the absorption of these substances before food is taken. The best methods for the purpose of diminishing digestive activity have not as yet been decided by them, but the substances which we have named, and which are commonly mixed with antitoxin for preservative purposes, seem to result in its more speedy absorption than occurs when pure antitoxin alone is given. If any method can be devised by which fairly accurate and reliable results can be obtained from the oral use of these substances, a distinct therapeutic advance will be made, and while the quantity of serum may of necessity be greatly above that now commonly employed by the hypodermic needle, the cost will be markedly diminished because of the simplified method of administration.

ON THE INFLUENCE OF INTRAPERITONEAL INJECTIONS IN CASES OF HEMORRHAGE.

The very wide-spread employment of normal saline solution for the purpose of combating the results of severe hemorrhage has undoubtedly been the cause of saving many lives during the last few years. We have more than once called attention to the need of employing carefully prepared solutions, and have pointed out that solutions which are not of the exact strength which is required by the organism are capable of producing harmful results.

In every case of severe hemorrhage the attending physician or surgeon is anxious to get the normal saline solution into the blood-vessels in the shortest possible space of time, and when the case is too urgent to

permit of hypodermoclysis, it is the habit of many operators to use intravenous injections.

In the *Journal of the American Medical Association* of November 3, 1906, Jampolis contributes an original research which leads him to advocate the intraperitoneal injection of warm sterile normal saline solution in intraperitoneal hemorrhage, not only with the object of obtaining a rapid absorption from the peritoneal surface, but also for the purpose of preventing the formation of large clots, and to aid in the speedy absorption of the blood which has been extravasated. In all he employed fifteen dogs in his experiments, and found that the dogs that received intraperitoneal injections, after internal hemorrhage was produced by artificial means, fared better than those that did not receive the injections. Again, he found that those that received injections showed no peritoneal adhesions when examined some days after the injury, and that in six of the seven that escaped infection organized clots were formed which would ultimately become fibrous adhesions. Again, he found that the blood was absorbed more rapidly in those dogs that received infusion than in those that did not.

The conclusions at which Jampolis arrives as the results of his experiments are of considerable value, but we are not sure that we can agree with the somewhat dogmatic statements which he makes concerning this matter. Thus, he asserts that normal saline should be infused into the peritoneal cavity in every case of hemorrhage not associated with infection because of its effect on shock and its local beneficial influence; and again, he urges that in cases of intraperitoneal hemorrhage accompanied by such severe shock that laparotomy cannot be performed at once, such injections will tend to support the patient until he can rally and receive operative assistance. Lastly, he does not think that such an injection requires great skill, and believes that any general practitioner can employ it. There are certain practical objections to this plan of treatment which deserve consideration. In the first place, it is very questionable whether it is not best that clotting should primarily occur in order that the hemorrhage may be arrested, and it is probable that the saline solution might interfere with this effort of nature to prevent further leakage of blood. Again, there is always a possibility that in giving the injection, infection may take place, either because the solution or the instrument used for injecting it is not perfectly sterile, or because microörganisms from the skin covering the abdomen are carried with the instrument into the abdominal cavity.

The third feature of considerable importance in connection with this subject is the influence which is exerted upon the general system, and the circulation in particular, by the introduction of considerable quantities of fluid into the peritoneal space. This influence seems to have been ignored in the experiments which we have quoted.

Many years ago the Editors of the GAZETTE carried out a series of investigations upon the influence of intraperitoneal injections upon the circulatory condition, which ultimately were accorded the Fiske Fund Prize of the Rhode Island Medical Society. In these investigations they found that while large quantities of fluid could be injected into the bowel under considerable pressure without doing any damage, the introduction of sufficient quantities of fluid into the abdominal cavity to produce even a moderate amount of intraperitoneal pressure resulted disastrously, and that the degree of distention of the abdomen produced by intestinal injection, even when very great, did not produce as deleterious results as a very slight degree of pressure produced by direct injection into the abdominal cavity.

It is also of vital importance that the fluid which is injected shall be of exactly the same temperature as the abdominal contents, as any variation from the normal, either above or below natural temperature of the abdominal organs, produces marked effects upon the circulatory state.

While Jampolis's investigations are of very considerable interest therefore, we are inclined to think that surgeons will do wisely

if they resort to intravenous injections rather than intraperitoneal injections in all such cases, and we very much doubt whether such intravenous injections will damage the patient's chances by aiding the hemorrhage as much as they will be damaged by direct intra-abdominal infusion. Whether the danger of peritoneal infection by these injections is very great must be decided by future investigation. It is a well-known fact that the uninjured peritoneum stands a large amount of insult, and even the introduction of pathogenic microörganisms if they are not present in too great number, and are not too virulent.

In the discussion which followed the report of these investigations we note with interest that Dr. Meltzer, of New York, was firmly convinced that if the hemorrhage occurred from a small vessel it was best to leave it alone, and that if it occurred from a large one the safety of the patient depended upon laparotomy and ligature performed at the earliest possible moment; and Dr. Vaughan expressed the belief that such injections might spread infection from the damaged abdominal viscus, whereas nature, if left to itself, would wall off the infected area, and so localize the difficulty.

THE RELATIONSHIP OF PLEURISY AND PULMONARY TUBERCULOSIS FROM A PROPHYLACTIC STANDPOINT.

Increasing knowledge of the early manifestations of pulmonary tuberculosis reveals the fact that in a very considerable proportion of cases the onset is insidious, not alone in the sense that the symptoms are not well developed, but also in the sense that the early manifestations of disease appear in a form which does not bring the word tuberculosis clearly before the mind of the examining physician. In some instances there is nothing more than a gradual decline in the degree of health without any distinct local manifestations. In others there is what is supposed to be a chronic bronchitis, and in still others the patient is supposed to be suffering from malarial infection or typhoid fever. In still another class of cases, and this is the class to which we particularly wish to refer in this editorial note, the patient is seized with a sharp attack of pleurisy which is supposed to be due to almost any other cause than tubercular infection, and which is expected to get entirely well within a very short time. It may or may not be accompanied by a pleural effusion. Ultimately, however, the subsequent course of the case proves that the primary illness was tubercular in origin. In another class of cases the degree of pain in the chest is so slight that it is ignored by the patient, who ultimately becomes dyspneic because of the gradual development of a large pleural effusion, which may be temporarily relieved by tapping. The lung, however, never expands to its former position, a cough gradually develops, and some months, or years, afterward the physician is forced to the recognition of the fact that an insidious tubercular pleurisy was the starting-point of the general pulmonary disease which ultimately destroys the patient's life.

These facts are, of course, more largely prognostic, diagnostic, and pathologic than therapeutic, and yet they afford us valuable information for practice. They impress upon us the necessity of examining such patients from time to time for a long period after the acute illness; of being continually on the *qui vive* for the development of an active tubercular process; and the need in many cases of sending the patient to a climate where he will lead an outdoor life, and where every means can be taken to improve his vital resistance to such a degree as to enable him to successfully combat the disease. The return of a patient such as we have just described to a badly ventilated office, or factory, or schoolroom cannot fail in a large proportion of cases to be followed by disastrous results. This return would not be permitted in the majority of instances if the possible tubercular character of the condition was borne in mind.

Considerable information as to the character of a pleurisy can be determined not only by a careful examination of the patient, but also of the fluid which is obtained by aspiration if effusion is present. Thus, if an

excessive number of lymphocytes are found in the effusion, it speaks for tubercular infection, but does not prove the presence of a tubercular process. It is not our intention in this editorial to claim that primary tuberculosis of the pleura is common, but rather that the presence of a tubercular lesion near the surface of the lung may first manifest itself by pleural disease, and that the physician must bear in mind that an attack of pleurisy may be very significant of tubercular disease.

THE DISSEMINATION OF TUBERCULOSIS THROUGH MILK.

The very important question of how frequently pulmonary and intestinal, or peritoneal, tuberculosis arises through the ingestion of tubercle bacilli in milk has been before the medical profession for a number of years, and many conflicting views have been expressed concerning it, some holding that tubercular infection very rarely takes place in this manner, and others believing it to be even more frequent than infection from dust laden with bacilli. It would seem to be pretty well proved at the present time that infection can take place by other means than inhalation, and that it takes place by the mouth—that is, through swallowing—with greater frequency than has heretofore been thought possible. The mere fact that tuberculosis of the lungs is so very much more frequently met with than tuberculosis in other portions of the body does not necessarily indicate that infection takes place most commonly by this route through inhalation, because the character of the circulation in the lung, both as to lymph and blood, is such as to favor the lodgment of tubercular bacilli in its tissues.

An interesting communication upon this subject has recently been published by the United States Department of Agriculture (Bureau of Animal Industry, Bulletin No. 86), in which Schroeder and Cotton have reported their experiments with various animals by feeding and injection. Their tests show how the lungs filter the blood, and so are frequently the subjects of tubercular disease, even when the microörganism has entered the body by another channel. They believe that the danger of tubercular infection by means of contaminating food is very marked, and that this possibility must always be taken into consideration in methods adopted for the purpose of preventing the spread of the disease.

EARLY DIAGNOSIS OF CANCER OF THE STOMACH.

It is not yet generally recognized that surgery has advanced to the point of justifying a favorable prognosis in case of cancer of the stomach, providing this condition be diagnosed and subjected to radical operation in its very beginning. It is unfortunately true that clinical, bacteriological, and chemical research has entirely failed to give us diagnostic signs at that stage of the development of the lesion in which operation can accomplish so much. In so far as the surgeon is concerned patients with gastric cancer are usually sent to him when there has been great emaciation, profound blood deterioration, palpable tumor, and long-standing symptoms of pyloric obstruction; when treatment as a rule can be merely palliative.

Modern clinical experience corroborates the pathological findings to the effect that the starting-point of carcinoma of the stomach is usually an ulcer. The Mayos have demonstrated this. Mouillin (*Lancet*, Sept. 22, 1906) states that it is probably true in 90 per cent of cases.

In considering the symptomatology of gastric cancer Mouillin lays some stress on distaste for food and pain as cardinal and early symptoms, especially when they occur without obvious reason in a middle-aged person who has previously enjoyed good digestion, and when they do not disappear in a week or two under ordinary treatment. Mouillin states that when such symptoms are present under such circumstances suspicion should be converted to a reasonable certainty.

Of the various methods of converting suspicion into certainty there are only two of the least use, and only one upon which much reliance can be placed. The first has

to do with a more exact knowledge of the working power of the stomach than can be obtained by inquiring into the patient's sensations; the second is by direct palpation through an incision.

The estimation of leucocytosis during the process of digestion, transillumination of the stomach, the testing of its absorptive power by administering some substance such as iodide of potassium, which ought to make its appearance in the excreta within a few minutes, radiography after ingestion of bismuth or other opaque substances, whether free or enclosed in an albuminous capsule which should dissolve in a certain time, and other methods which have been tried from time to time, give results which cannot be relied upon; moreover they are troublesome. The test meal, preferably salted oatmeal soup, administered after some hours of fasting and gastric lavage, is siphoned in an hour and examined. If the chemical examination shows the absence of free hydrochloric acid or the presence of lactic acid and the presence of the Oppler-Boas bacillus, exploration is imperatively indicated, though these chemical findings are possible in the presence of other disorders, such as simple dilatation, chronic gastritis, and atrophy of the stomach wall. It is, unfortunately, true that negative evidence is of no value, since even though cancer be present hydrochloric acid may be secreted in almost normal quantity and lactic acid may be entirely absent. These investigations are then of service only when the finding is positive.

Mouillin speaks with some feeling against what he calls a roving commission inside the abdomen, but when there is definite evidence that one particular organ is not doing its work as it should do, when there is no reason to be found why it does not, and when it is clear that the patient's health is beginning to suffer, he holds that exploration is no longer a roving commission. Moreover, the operation, even though nothing be found, is in itself entirely innocuous. Mouillin quotes Hemmeter to the effect that "the simple continuance of a chronic gastritis, or nervous dyspepsia, in spite of logical and scientific treatment, accompanied with progressive loss of body weight during three or four weeks, justifies the suspicion of latent gastric carcinoma," and concludes his article with the statement: "If you suspect the existence of cancer you must not wait."

The profession is rapidly coming to the acceptance of such teaching, and although this will doubtless lead to many operations which will remain purely exploratory, it will tend more than any single factor to lessen the ultimate mortality of carcinoma of the stomach.

CONCUSSION OF THE SPINE.

Corner (*Lancet,* Sept. 22, 1906) holds that concussion of the spine is one of the rarest of injuries. As to the pathology of the affection, the injury may consist in molecular disturbance and displacement, multiple hemorrhages, or displacement of cerebrospinal fluid. Corner points out that general concussion of medullated fibers is unknown, but that non-medullated fibers and nerve cells are peculiarly subject to concussion. On this basis he explains thoracic and abdominal shock, concussion of the non-medullated sympathetic system producing a condition of vasomotor paresis. The brain is anchored by the nerves at its base, thus allowing its upper parts to make considerable excursions. The case of the spinal cord is different. The cord is tethered on both sides by the nerves and the ligamentum denticulatum, so that it cannot come into contact with the walls of the canal in which it lies. Therefore general concussion of the spine must necessarily be extremely rare. That local concussion is, however, not so rare and can be recognized clinically is suggested by some cases which Corner reports. The first is that of a man who fell from his horse, and without losing consciousness immediately became completely paralyzed in all four limbs with corresponding anesthesia. After half an hour this paralysis and anesthesia began to pass off. This patient was extremely ill for several weeks, and it was only by means of the *x*-rays after the lapse of six years that the

existence of a fracture of his second vertebra, the axis, was proven to have occurred.

A second case, the patient being an acrobat, received an injury which was followed by an immediate paralysis and anesthesia of all four limbs and the trunk. The symptoms cleared up in about twenty minutes. This patient subsequently recovered completely, and a skiagraph showed that he had sustained a fracture of the body and pedicles of his fifth cervical vertebra.

In the third case the man was kicked between the shoulders by a horse and was found lying semiconscious in his stable. The bruise was found high up between the shoulders, and the lower limbs were completely paralyzed and anesthetic. Breathing was almost entirely diaphragmatic, and the movements of the upper limbs were limited to flexion of the wrists and the fingers. Anesthesia, priapism, and retention of urine were present. The pulse was 44 and temperature normal. Death took place on the second day. Post-mortem failed to show any fracture or dislocation of the spinal column, nor was there any visceral disease. The cord itself showed no sign of hemorrhage within or without. There was no obvious cause for death.

These cases strongly suggest that at least some of the reported betterments or cures following laminectomy for the relief of pressure incident to traumatism would have followed even more surely had the patient been treated conservatively.

It seems well demonstrated that a transverse crushing of a section of the spinal cord is irremediable; it is, however, not generally recognized that symptoms simulating this condition exactly may develop immediately after a trauma which has been contusing but not destructive. The diagnosis of such a condition can be made only by the lapse of time.

REPORTS ON THERAPEUTIC PROGRESS.

VASCULODEPRESSOR DRUGS.

SAUNDBY in the *British Medical Journal* of October 20, 1906, says that every one is well acquainted with the value of heart tonics, and employs them more or less extensively, but it is doubtful if a sufficient use is made of the vascular depressants, which are of great utility in the management of advanced cases in which the heart seems no longer able to answer to the whip. They act by relaxing the peripheral arterioles, and by lowering the blood-pressure they lighten the burden the heart has to bear. Among the best known of these drugs are amyl nitrite, ethyl nitrite, sodium nitrite, glyceryl trinitrate or nitroglycerin, erythrol tetranitrate, mercury in various forms, and iodide of potassium. Ethyl nitrite has long been familiar, as it is contained in sweet spirit of nitre, but is unstable, and although the late Professor Leech, of Manchester, endeavored to bring it into favor it has not proved satisfactory; amyl nitrite is useful, but has obvious disadvantages in certain cases; nitroglycerin in one-per-cent solution is active, safe, easy to administer, and can be dosed to the requirements of each patient; nitrite of sodium has not given the writer equally good results; but all these are very transient in their effects, hence they are more valuable for removing pain than for giving permanent relief to the heart. Nitroglycerin has afforded him valuable assistance in the management of advanced cases of heart disease in which there has been oppression or pain suggesting angina pectoris, his patients being instructed to carry a small bottle containing one or two minims of the solution made up to a teaspoonful dose, which they take when the distress comes on. He prefers this solution to the chocolate tablets. Some years ago a patient was recommended by the late Sir Andrew Clark to use these tablets, but did not experience the desired relief, so one day the author tested them on himself; one tablet produced no effect, so he followed it by a second and a third; in a short time all

three took effect; but this is not what we want to order to help a patient taken suddenly with oppression or pain at the heart.

Erythrol tetranitrate is the drug on which he now relies to produce a permanent unloading of the weight on the heart. It was brought to notice by Professor Bradbury's Bradshaw lecture delivered in 1895, in which it was shown that the lowering of the pulse tension resulting from a single dose lasts fully four hours. Of the truth of this observation any one can convince himself if he will take the trouble to make a series of sphygmographic tracings before and after administering the drug. Dr. John Stead, house physician, of Staunton-on-Wye, Herefordshire, in 1895 took a number of tracings to illustrate this. Since then the author has used it regularly in hospital and private practice, but it is in hospital practice that he has most opportunity for watching its effects, and is convinced that it can afford relief to patients who derive no benefit from other cardiac remedies.

The usual dose of the tetranitrate is one-half grain in a tablet. It should be given every four hours while the patient is awake; but it may cause headache occasionally, very rarely so severe that the drug has to be stopped. The author sometimes combines it with Nativelle's digitaline, giving the drugs alternately with four-hour intervals between the doses of each.

The value of mercury as a vascular depressant is maintained by some authorities, but its action seems to be limited to its power of getting rid of those alimentary poisons which set up vasomotor spasm. Professor Dieulafoy treats chronic disease of the heart and great vessels by hypodermic injections of a solution of biniodide of mercury. After hearing his clinical lecture (see *British Medical Journal,* 1905, vol. i, p. 1337) Saundby gave his method a trial, but saw no good results, while the injections gave rise to much local pain and frequently to suppuration, so that he soon abandoned its use. We all use Baillie's pill (the combination of digitalis, squill, and blue pill) in some forms of cardiac dropsy, for which it possesses an established and well-founded reputation, but it is not known that its effects are in any degree attributable to the action of the mercury it contains on the vascular system. Iodide of potassium is frequently used in combination with other cardiac remedies, less often by itself; its utility is certainly not limited to cases of supposed syphilitic aortitis, but depends on its action as a vascular depressant.

Belladonna is a drug in which the author has no great confidence in the treatment of heart disease, but this may be because he has not become accustomed to the proper indications for its use. Belladonna plasters apparently relieve some kinds of heart pain, but they are dirty, unpleasant things, which interfere with auscultation, and are only fit for out-patients.

Bleeding from the arm and leeching the precordia are means adopted in cases in which there is evidence of marked engorgement of the right side of the heart. Bleeding is the most speedy of all for relieving the heart, but is one which cannot be repeated except at comparatively long intervals; while its effects are prompt they do not last, and the danger is liable to recur. The results are striking, and death has often been postponed by timely bloodletting, but the conditions are generally unfavorable to complete recovery.

THE DIETETIC TREATMENT OF ENTEROCOLITIS.

The *British Medical Journal* of October 13, 1906, contains an article by MORSE, of Boston, upon this topic, in the course of which he asserts that in beginning the treatment of these cases the food should always be stopped entirely for a longer or shorter time. The duration of the abstinence from food must vary in individual cases, according to the severity of the illness and the ability of the given infant to bear starvation. All babies stand starvation well for twenty-four hours, most of them for forty-eight or seventy-two hours, and some of them even longer, providing they are given a sufficient amount of water. They can bear the prolonged withdrawal of food, but they cannot bear the prolonged withdrawal

of water. They must be given at least as much water in the twenty-four hours as they normally get in their food. It is not enough to direct that plenty of water be given; the amount of water to be given must be specified in the same way as are the doses of medicine. If the baby will not take it willingly by the mouth it must be given with a tube. If it is vomited it must be given by the intestine. If it is not retained by either the stomach or intestine it must be given subcutaneously in the form of physiological salt solution; 2 to 6 ounces may be given at a time, according to the age and size of the infant. It is useless to repeat the injection before the preceding one has been absorbed. The water takes the place of the liquid normally ingested with the food, replaces that lost in the vomitus and dejections, aids the heart by keeping the amount of circulating fluid at the proper level, favors the elimination of toxic substances through the kidneys, and diminishes the irritant action of these substances on the kidneys.

While every one now believes in the necessity of an initial period of starvation and water diet in these cases, there is much difference of opinion as to whether milk in some form, or some substitute for milk, should be given when feeding is begun. Those who believe in milk do so on the ground that the pathogenic microörganisms are usually originally in the milk, and would therefore be expected to thrive better in it than in any other medium. This argument hardly seems sound, however. The bacteria enter in the milk simply because milk is the baby's food, not because it is the best culture medium. No one thinks of choosing milk as the medium on which to grow these same organisms in the laboratory; he chooses, rather, preparations of meat or carbohydrates, the very materials from which the usual substitutes for milk in these diseases are made. Clinically, nevertheless, these patients certainly do better when they are fed for a time on some substitute for milk. It is the opinion of the author that the more favorable results obtained from these substitutes for milk are, to a certain extent, to be attributed to the weakness of the food, which in many cases amounts to little more than water. Few realize how little nutritive value these various substitutes for milk have. Barley water, as usually prepared, contains only about 0.05 per cent of fat, 0.25 per cent of proteid, and 1.50 per cent of starch, thus containing only one-tenth as much nourishment as milk. The white of one egg is equal in nutritive value to only three-fifths of an ounce of milk. Beef juice contains 0.6 per cent of fat and 2.9 per cent of proteid, giving a nutritive value, bulk for bulk, only one-quarter as great as milk. Broths contain only about 1 per cent of proteid, and hence have very little nutritive value. In many cases milk preparations in a similarly dilute form will yield essentially the same results as these substitutes. Personally, however, the author almost invariably begins to feed these cases on some substitute for milk. There is another objection to milk foods to which these substitutes are not open, and that is the comparatively large residue from milk, which tends to keep up the intestinal irritation, especially if there are ulcerative lesions. This point must also be borne in mind when beginning to feed with milk.

In choosing the substitute for milk the attempt should be made to select, if possible, a food on which the bacteria which cause the disease grow with difficulty. That is, if the bacteria in question are those which thrive best on starches and sugars, the food should be largely proteid in character, while if the bacteria are those which thrive on proteids the food should be composed of starches or sugars. While this is true theoretically, it is of comparatively little practical utility, because many bacteria thrive well on both sorts of culture media, and because the determination of the etiological bacteria is usually difficult and always requires considerable time. A clinical rule of some value is that sour stools mean bacteria which thrive on sugars and starches, and foul stools those which thrive on proteids. It is the belief of the author that in these conditions babies do better, as a rule, on starches and sugars than on proteid foods.

Personally he uses barley water and milk-sugar in preference to other preparations of starch or other forms of sugar. In this connection it must be remembered that the power of utilizing sugars may be much diminished in enterocolitis as the result of degenerative changes in the liver, and that an excess may easily be given. White of egg in the form of albumen-water, beef juice, and broth may be used when proteids seem to be indicated. White of egg, however, is very likely to produce an angio-neurotic edema, while beef juice and broth not infrequently cause very foul, watery stools. The extractives which they contain are also liable to increase peristalsis and to irritate the kidneys. Whatever substitute for milk is used, the amount of liquid must be kept up to the required limit, just as in the starvation period.

The most difficult point to decide in the dietetic treatment of enterocolitis is when to resume milk feeding. The temperature, the condition of the nutrition, and the character of the movements are the best guides. It is seldom wise to give milk when the temperature is much above normal. Many authorities do not begin with milk foods until the movements have become normal in character. Unless this happens within a few days or a week, however, there is great danger of losing more in nutrition and strength on account of the weakness of the substitute food than is gained by the use of the theoretically less suitable culture medium milk. If the temperature is not much above normal it is wiser on the whole, it seems, to resume milk feeding after not longer than a week, even if the character of the movements has not returned to normal.

When beginning to feed with milk it is often difficult to decide in what form to give it. In those cases in which the character and odor of the movements give fairly definite indications as to the use of carbohydrates and proteids in relation to the intestinal flora, as already referred to, these indications should be followed in regulating the percentages of sugar and proteids in the mixture. On general principles, however, a modified milk prepared from fresh milk, low in all its percentages, feebly alkaline and pasteurized, should be given. It is better to give small amounts frequently than large at long intervals. In general, the percentage of sugar may be comparatively high, while that of the proteids must be comparatively low. The fundamental principle, however, is to give a dilute food. It is also of advantage in certain cases to use any or all of the methods of modifying milk which render the proteids easier of digestion and absorption. It is often better, therefore, to begin with whey mixtures, peptonized mixtures, or barley mixtures than with straight modifications. The mixtures must never be highly alkaline, as a high alkalinity tends to throw the work of digestion off of the stomach on to the intestine.

TREATMENT OF TUBERCULAR DISEASE OF THE UPPER RESPIRATORY TRACT.

HAMILTON writes on this subject in the *Australasian Medical Gazette* of September 25, 1906. He believes that in dealing with each case of tubercular laryngitis the first thing we have to decide is whether the treatment is to be palliative only or whether we are justified in doing something more radical to attempt to cure the condition by surgical measures. Lessening the severity of the cough is one of the things which should always demand our attention. Often enough the cough is largely due to irritation, and that in the larynx and not the lung. This can be successfully controlled by sedatives, of which perhaps, first, codeia is the most useful. This drug may be called "the opiate of the larynx," as it seems to act more promptly in allaying laryngeal irritation proper than any other preparation of opium. The following combination the author has used for many years, and knows of none more effective: Codeiæ, chloral croton, ää gr. x; syr. tolutanæ, aquæ laurocerasi, ää ʒj; one drachm (undiluted) for a dose. Second, dionin: it is an excellent sedative, either when given alone or as an adjuvant to morphia. It also relieves pain and puts the patient in a condition of rela-

tive euphoria. It is therefore indicated in cases in which odynphagia is a prominent symptom depending on ulceration of the epiglottis, arytenoids, etc. Third, heroin: it allays cough and is an analgesic when applied locally. It reduces the sensibility of mucous membranes, and is cumulative in its effect, relieving pain at first only for a few hours, and later on for a much longer period.

Odynphagia is a symptom which we cannot afford to allow to continue unrelieved, seeing that the prognosis of these cases depends so very much upon deglutition. For some years past orthoform has held its own as an analgesic, being more prolonged in its action and not open to the objections which apply to morphia and cocaine; but we have now in anesthesin an even more reliable remedy. It is, the author believes, the most valuable local anesthetic for the interior of the larynx which we now possess. Its sedative effect is greater and even more lasting than that of orthoform; it is also less toxic; it may be insufflated as a powder, or the patient may apply it by the self-inflating glass tube invented by Ludin; or it may be applied in solution of oil of sweet almonds, as, unlike chloroform, it does not decompose in contact with fats. The author has had lozenges of anesthesin and adrenalin made, which are very soothing to the throat. Anesthesin is also most useful for postoperative application—*e.g.*, after curetting any of the intralaryngeal surfaces. It relieves the pain and hastens the healing process by preventing the croupous exudation formation which appears on mucous surfaces after operations.

Of the various surgical measures of treatment the author refers to but two: First, curettement, followed by lactic acid or some such application. Lactic acid has been said to be the most abused and misused of local remedies. The true indication for using a strong caustic like lactic acid is when we have to do with a chronic limited ulceration over a shallow infiltration, or one that has been made shallow by removing the main deposit by curettement. It is not necessary or desirable that this procedure should be painful or disagreeable to the patient; therefore the parts should be previously rendered anesthetic by the application of a mixture of cocaine and adrenalin. The application of lactic acid to an unbroken surface is of very questionable value, and if a strong solution be used it only gives the patient distress without any good resulting therefrom. Some one of the following applications may be substituted for lactic acid in certain conditions: Pheno-salyl, phenol-glycerin (which the French laryngologists use), formalin in glycerin (recommended by Bronner), and sulphoricinate of phenol. In sloughy, indolent ulcers a preliminary application of peroxide of hydrogen is distinctly beneficial; but to be effective this medicament must be pure, of which none are more reliable than peroxide of hydrogen purissima. Second, ablation of the epiglottis and the arytenoids. Of all parts of the larynx the epiglottis is the least amenable to treatment. It resists longer the good influence of sanatorium treatment; therefore its removal is a very valuable therapeutic agent. It can be done under local anesthesia, and Grünwald's cutting forceps are now used by all operators in preference to the cold or galvanic snare. It is quite remarkable what prompt and complete relief follows its removal. Immediately after the operation the patient can swallow with comfort, even when deglutition had been painful in the extreme before the operation. The same applies to ablation of the arytenoids, for which Lake's forceps are used. Scarification of edematous surface is another procedure which is often necessary to relieve dyspnea. This, however, should not be resorted to indiscriminately, seeing that the scarifications may open up deeper tissues to further infection. Mackenzie's sheathed knife is a good instrument for this purpose. It was to obviate the danger of reinfecting new surfaces that Grünwald recommended the galvanocautery instead of the knife. Of this treatment, however, the author has as yet no experience. That the epiglottis can be removed without any inconvenience in swallowing resulting therefrom to the patient this operation clearly

demonstrates, and it shows that the epiglottis plays no important action in deglutition. Its main function is not to prevent food passing down into the glottis, but to keep the secretions of the upper air-passages from entering the larynx while it is in a state of rest.

As the tendency for the last few years has manifested itself in doing away with drugs for the general treatment of tubercular diseases, to depend upon open air and the sanatorium, with the addition of purely symptomatic medicinal treatment, the author concludes by recording his experience of two drugs which he cannot but think have a very distinct utility *per se*. These two are thiocol and ichthyol.

1. Thiocol is a remedy which deserves special consideration from the physician as a remedial agent in tuberculosis. It is a derivative of creosote. It is soluble in water, almost tasteless, and can be administered even to infants. It is a remarkable stomachic, and has antipyretic action. By its stomachic action it increases appetite, while its antibacillary power and its property to increase the agglutinating functions of the blood and also the emigration of leucocytes probably explain its beneficial influence upon tubercular foci. More guaiacol can be brought into the system by thiocol than by any other preparation of creosote. It improves appetite, ameliorates cough and expectoration, and brings about an increase of weight. It has been proved that 70 to 80 per cent of the ingested thiocol is absorbed, and that the drug is not split up into guaiacol and other compounds. The germicidal efficacy of the blood serum during the administration of thiocol has been demonstrated, and it has been found that such serum is directly inimical to streptococci. Cases are recorded in which examination of the sputum showed the presence of tubercle bacilli in abundance associated with pyogenic cocci and various bacteria, and after a month of thiocol treatment a great diminution of the tubercle bacilli had taken place and the associated bacilli had entirely disappeared. Hemoptysis is no contraindication for its use.

2. Ichthyol. This drug is somewhat similar to thiocol; it, too, acts by improving nutrition. It lessens cough and expectoration. Both these medicines deserve a place in the routine treatment of tubercular diseases, given internally and applied locally, and according to the author's experience, extending over a long period, nothing but good can follow the regular and systematic use of the same.

THE VAGINAL TAMPON—SOME POINTS OF PRACTICAL INTEREST.

SOUTHER in the *Lancet-Clinic* of October 27, 1906, writes on this subject.

For antiphlogistic purposes he says the reducing of the size of the uterus is a matter of drainage—drainage from, or into, two avenues, viz., the vessels, veins and lymphatics, and through the os uteri. The first-named channels we must aid all we can by putting the uterus in proper position, correcting deviations, and removing infection, which necessarily causes an increased flow of blood to the organ.

The uterine cavity should be relieved of all excessive mucous membrane, hypertrophied tissue or polypi, and remains of incomplete abortion or miscarriage. The question of packing, or simply inserting a gauze drain in the uterus, depends on the individual case and on conditions present. For packing, gauze is probably the best material we have, but should be used wet or moistened with one of the antiseptic solutions mentioned, as it drains better, and can be packed very tightly when pressure is desired. After the above has been accomplished the character of tampon depends on the immediate result desired and amount of support necessary. For simple depleting a large, loose tampon wet with some of the glycerides, with their hygroscopic action, gives best results. Where cases are confined to bed a copious hot douche of two to five gallons, four times a day, until a fair degree of contraction and involution takes place, is certainly followed by good results. The douche nozzle should be inserted posterior to the cervix, the cul-de-sac kept clean, and by so doing produce as much

depletion and contraction as possible. Following this the boroglyceride tampons should be used daily for simple depletion in long-standing cases. In acute cases he has used mostly carbolic acid and iodine, separate or combined, followed with alcohol; or $AgNO_3$, 10 per cent, applications to the cervix, followed with cotton tampons medicated with ichthyol 25, glycerin 250. This combination has given him excellent satisfaction in acute vaginal and cervix cases, and seems to be almost a specific for venereal warts invading the vagina and cervix. Early in these cases the tampon should be used every day, and the cervix carefully cleansed before its introduction.

This treatment has given relief in every case of acute gonorrhea with endocervicitis, frequent urination, and profuse discharge, within forty-eight to seventy-two hours, and sometimes almost the first application. In this way we are able to control the discharge, and hence do not have the disagreeable effects of the parts being bathed in pus.

The question of lamb's-wool tampons, or tampons made of springy materials, is well worthy of consideration, and these are very excellent in deviations, but not so strongly indicated in hemorrhage and depletion as cotton, because it cannot be packed so tightly and its power of absorption is not so great. However, a material that retains its bulk and does not pack certainly has some advantages over absorbent cotton in cases of true version.

NOTES ON SOME ANESTHETIC METHODS.

McGowan in the *Australasian Medical Gazette* of September 20, 1906, in speaking from a long experience of morphine and atropine antecedent to a general anesthetic, points to some disadvantages of such methods. Atropine and scopolamine have much the same characteristics, and his observations on "mixed" anesthesia with morphine and atropine, followed by chloroform or ether, will apply equally to morphine and scopolamine followed by a general anesthetic:

(1) The small amount of chloroform used is no criterion of safety. How often have we not heard of deaths when only a few drops have been exhibited to the patient? (2) With this mixed anesthesia the eye reflexes, and in particular the pupilary reflexes, are utterly unreliable. (3) One has difficulty therefore in judging the depth of the anesthesia, and in saying how much is due to morphine and how much to chloroform. (4) In consequence the patient often most inconveniently emerges suddenly from an apparently deep anesthesia, and presents active clonic or tonic movements of which one has no warning. (5) If respiration ceases under chloroform in such cases, much more difficulty is experienced in causing the respiratory center to respond to stimulus than if the center had not been previously dulled by morphine. (6) The narcotics fix the chloroform in the blood for too long a period after the operation is over by their action in checking excretory functions. Prolonged postanesthetic coma and vomiting are thus often noticed. These are disadvantages experienced personally by the author in the use of such mixed anesthesia, though of course he is not adversely criticizing the morphine and scopolamine or morphine and atropine followed by a general anesthetic as routine practice.

In one class of operations—that is, on the rectum—the mixed anesthesia gives excellent results. One-fourth grain of morphine and 1/200 grain of atropine half an hour before ether anesthesia quite averts the alarming laryngeal spasm and general shock from dilating the sphincter ani, so often seen under chloroform.

DUODENAL ULCER.

Hutchison in the *Clinical Journal* of October 17, 1906, says that the treatment of duodenal ulcer, like that of ulceration of the stomach, may be either medical or operative. The first involves putting the patient at rest, careful feeding, and the use of local poulticing and the administration of bismuth and the alkaline earths according to the method often described by the

author as "ulcer cure." Operative treatment resolves itself into the performance of gastroenterostomy. In all doubtful cases the author believes it is right to try medical treatment first, but assuming that melena has occurred, and that the diagnosis is no longer in dispute, is it worth while to waste time in an attempt to get the ulcer to heal, or should one recommend early operation? Now there can be no doubt that healing may occur. In one of the author's patients, for instance, after a severe attack of melena, the symptoms disappeared and he remained in perfect health for two years. The author doubts, however, whether one is justified in trusting to this. Certainly in that case the ulcer ultimately broke down again, or fresh ulceration supervened, and operation had to be performed. When one remembers that every patient with a chronic duodenal ulcer is, so to speak, on the edge of a precipice and that at any moment perforation may occur, with the tremendous risk to life that such an occurrence involves, and when one sets against that the comparative safety of a timely gastroenterostomy in experienced hands, then one must decide that it is one's duty to advise operation in every certain case at once. The results of such a proceeding are, in the great majority of cases, entirely satisfactory, although in one case known to the author the patient again suffered from severe bleeding from the bowel, fortunately, however, with ultimate restoration to health.

STANDARDIZATION OF PHARMACEUTICAL PREPARATIONS.

The great advances which have been made of late years in our knowledge of the action of drugs are evident from even a cursory examination of recent works on pharmacology. As a result a stimulus has been given to the teaching of this subject, and its great importance in the medical curriculum is now recognized in our schools. We may fairly ask whether the scientific preparation of the drugs used in daily practice has kept pace with researches upon their action. Definite chemical compounds such as magnesium sulphate or morphine are available in a pure form and the dose can be accurately measured, and it is no less desirable that in the administration of ordinary tinctures and extracts owing their action to the presence of an alkaloidal or other compound, the proportion of this substance should be known. With this object in view some of the more powerful medicines in the Pharmacopœia are standardized by chemical means. The determination of the amount of strychnine in the compounds of nux vomica leaves little to be desired. It is doubtful, however, whether the estimation of morphine in opium gives the best possible measure of the power of that drug, for there is a not inconsiderable quantity of other active alkaloids. In the preparation of belladonna, ipecacuanha, and quinine the total alkaloids are determined by titration or weighing, and in tincture of jalap the amount of resin.

There remain many active drugs of the strength of which there is no real guarantee: such are digitalis, strophanthus, squill, ergot, lobelia, male-fern, thyroid extract, the vegetable purgatives, aconite, hyoscyamus, and stramonium. We may, perhaps, exclude the three last named, for from aconite aconitine is prepared, from hyoscyamus and stramonium the alkaloids hyoscine, hyoscyamine, and atropine, and these substances may come to take the place of the crude drugs. From digitalis substances purporting to be pure principles have been obtained and extensively tried, but most observers are agreed that better results follow from the infusion and tincture than from the samples of digitalin and digitoxin at present on the market. The careful methods of preparation employed by pharmacists are a sufficient safeguard against such an uncertainty of composition as might render the use of three unstandardized medicines dangerous. On the contrary, such drugs as digitalis, thyroid extract, and stramonium are used daily with the greatest success, and lead to an incalculable alleviation of disease. Nevertheless it is evident that those medicines are not employed under the most advantageous

circumstances permitted by the present state of science. The application of pharmacological knowledge at the bedside is deprived of much of its force by the want of exact information as to the real strength of a tincture or an extract. Valuable time is thus wasted, for an insufficient dose is at first prescribed in order to avoid the possibility of giving more than is necessary or desirable.

Owing to the great complexity of organic products, accurate standardization by chemical procedures is not at present possible in all cases, although with the examples before us of the daily employment of such substances as strychnine and caffeine we have good reason to look forward to the extraction in a pure form of the active principles of all drugs, and to their use under constant conditions of dosage and composition. In the meantime, and especially where we are dealing not with alkaloids but with the more elusive glucosides, such as those of digitalis, strophanthus, and squill, physiological standardization seems to be the only alternative. Pharmacologists have determined the lethal dose of most drugs for animals, per kilogramme of body weight, and by a comparison with these figures the strength of any preparation can be ascertained and adjusted to a definite standard. This method is used in the manufacture of antitoxin. It may be objected that figures obtained from animals, and particularly from cold-blooded animals, such as the frog, are not applicable to man. We believe that this argument has no further force, since while the same drug may affect different species in a different degree, and frequently does, a preparation which is of double strength for one animal will be of approximately double strength for another. Thus, although the susceptibility of an animal for a drug might be less or greater than that of a man, nevertheless if the lethal dose of a preparation of the drug for that animal were ascertained, it would give a reliable guide to the strength of the tincture or the extract. Again, the variations of susceptibility which occur in different species have been carefully ascertained for the animals used in pharmacological researches as compared with man, and can be fully taken into account, and when necessary allowed for. Indeed, the standardization of drugs by the physiological or biochemical method has great advantages over the purely chemical, for in the former we are dealing with the same kind of reaction as that to which the drug owes its medicinal effect, namely, the reaction of the living tissues.

In the case of digitalis, strophanthus, and squill we have recently referred to the great necessity for the adoption of a physiological standard, such as that obtained by determining the lethal dose for a frog of a given weight under constant conditions. In the administration of thyroid extract, or of ergot, if the desired effect be not produced it would be of special value to be certain that the preparation used was not at fault. Although we must recognize that the drugs under discussion cannot be so exactly measured as pure substances, yet we have a right to expect that such accuracy as the present state of chemical and pharmacological science can afford should be at the disposal of every practitioner of the healing art — *British Medical Journal,* Sept. 8, 1906.

THE TREATMENT OF EPILEPSY.

In the *New York State Journal of Medicine* for October, 1906, SPRATLING asserts that the one factor that has done more than anything else to retard the successful treatment of epilepsy since Laycock first used them for this purpose in 1847 has, in the judgment of the author, been the universal and irrational use of the bromides. It is a significant fact that in the prebromide days the percentage of cures in epilepsy, according to excellent authorities, was greater than it is now. He believes the bromides have a limited sphere of usefulness in epilepsy in that they lessen cortical irritation and hold attacks in check while other forms of treatment are being applied and are having an opportunity for action. In themselves alone, it is the belief of the author, they are powerless to cure epilepsy. Why give a drug that is mildly destructive in action

in the long run—and the bromides must be given for years—to reconstruct a congenitally weak brain, or to help eliminate a systemic poison?

If we give the bromides we should begin with six or eight grains three times a day, but not go beyond fifteen grains, unless for a limited time to check serial attacks or status epilepticus. The bowels should be kept freely open, and the skin highly active by baths and massage, so that the danger of bromic acne and general bromism will be lessened.

We can adopt Toulouse's method of salt starvation, and get better results from fifteen grains of bromide a day with no sodium chloride in the food than we can with thirty grains and the usual amount of salt in the food.

Toulouse's plan is a good one, but requires special food preparation, and in many instances this is not easy.

A still better plan is to use the pure bromine in the form of bromipin, giving it as an emulsion. It does not produce acne, is not apt to disturb the alimentary canal, and most patients gain in weight under it.

The opium-bromide treatment of Fleschig so popular some years ago has been discarded.

Borax in fifteen- to twenty-grain doses is often effective when the bromides fail to suppress the attacks.

Chloretone was found useful by Weeks in three- to five-grain doses, while he had used brometone in five-grain doses, morning and noon, and ten at night, with excellent results in several cases during the past two years.

A boy of eighteen came under the author's care with his face a mass of foul sores from one hundred and twenty grains of bromide he had been taking daily for ten years. His epilepsy was mostly of a motor type. The writer stopped the bromides as quickly as possible, put him on brometone, and the effect was almost miraculous. In nine weeks his skin cleared up almost like a baby's, his eyes brightened, his appetite increased, and his attacks dropped from five to seven in a month to one in three months. He is still improving, and the author looks for a cure in two or three years more. He is also taking iron and strychnine, cascara sagrada, and is held to a most absolute diet, under a strict form of living, being under the supervision of a competent person constantly.

Zinc, urethane, simulo, solanum carolinense, which is an excellent preparation in many selected cases, trional, and the coal-tar derivatives, are all more or less useful, though their value is not apt to be lasting.

The author believes that surgery has a field of usefulness in epilepsy, and we are learning to appreciate more fully as we operate with more care, and in cases selected with greater caution. Outside of operation on the brain—which of course is the great field for surgery in epilepsy—many cures have been effected at Sonyea through abdominal and other operations, the abdominal work being wholly among the women. Cases for laparotomy should be studied for months previously, and especially observed at the time of the menstrual epoch.

Roswell Park resected the cervical sympathetic nerves and ganglions on both sides of the neck in three cases nearly three years ago at the Colony, the result being that two of them have had no attacks since. All presented a definite aura of violent flushing of the face just before the fit.

Errors of refraction should be corrected. Foreign growths in the nose, adherent foreskins, old scars that are tender, and other focal conditions that may incite convulsions should be dispensed with.

Do not look for brilliant results from surgical intervention in epilepsy immediately after the operation. Rather regard the operation as the beginning of a new course of treatment, and keep up the use of other remedies with greater persistence than ever. In fifteen years the author has learned that a surgical operation performed this year may set in progress a cure that will not be complete for several years, though the operation originally began the cure.

AN EXTRAORDINARY CASE OF POISONING BY MORPHINE.

An inquiry was recently held at Brighouse as to the death of a man who had died from an overdose of morphine. The interest of the case lies in the huge dose of the poison which was taken. The deceased was aged forty-three years and had lived for some time in China, where he had acquired the morphine habit. As is frequently the case in such circumstances he had accustomed himself to take very large doses, and Mr. R. T. Farrar, who gave evidence at the inquest, stated that he used to take as much as 60 grains of hydrochloride of morphine in a day. By means of a telegram and prefixing the title of "Doctor" to his name the deceased obtained two gross of pills, each pill containing a dose of two grains of hydrochloride of morphine, equivalent to a total quantity of 576 grains. He took this enormous dose within twenty-four hours, and two hours before his death he swallowed 100 of the pills—that is to say, a single dose of 200 grains. After a short period of excitement paralysis of the respiratory centers ensued, which ended fatally.

We believe that this is the largest dose of morphine that has been reported, and it is remarkable that the man should have lived so long after taking it. The toleration established by prolonged use of the drug is the only explanation that can be given. The coroner rightly commented on the comparative ease with which morphine can be purchased by non-medical persons. The unusual dose of two-grain pills might perhaps have given rise to suspicion, but as the telegram purported to be signed by a medical man the druggist apparently did not make further inquiries. There are several practitioners in the Medical Directory of the name which was on the telegram, so that reference to that volume could not have been of much assistance. It is difficult to suggest how such occurrences can be avoided, but we think it would be well for druggists not to send large quantities of poisonous drugs in reply to a telegram unless the sender of the telegram is known to them or unless the name and address can be corroborated by means of the Medical Register or the Medical Directory. Another point of interest is the manner in which death took place. The symptoms were of a tetanic character, and the usual comatose condition did not develop. This mode of death is fully recognized in fatalities from morphine poisoning, but it is not of common occurrence.—*Lancet*, Sept. 22, 1906.

HEART TONICS.

In the *British Medical Journal* of October 20, 1906, SAUNDBY writes in an interesting way on this subject. He well says that among reputed heart tonics digitalis and its alkaloids hold the first place. In its various pharmaceutical forms it is a most trustworthy drug, and it is not quite obvious how it acquired the bad name that it seems to have borne in the first part of the last century. When the writer commenced practice it was common to meet men who considered it a dangerous cumulative poison, which in ordinary doses was liable to cause unexpected and alarming symptoms. Dr. Balfour used to point out that when the infusion of the Edinburgh Pharmacopœia was in use it was customary to give the equivalent of from 3 to 12 grains of the leaves three times a day or more often. Dr. Blackall, of Exeter, in his book on dropsies, published in the year 1813, wrote that the common people in his neighborhood were in the habit of using very strong and copious infusions of digitalis made by throwing boiling water on the leaves, stem, and root, without any measure or weight; and it can be well understood that with such rude pharmacy accidents might happen. He recommends an infusion made with a drachm of the dried leaves to half a pint of boiling water, which is more than twice the strength of the present infusion, but the only inconvenience of which he complains is that it may "upset the stomach and cause so much disgust that there is difficulty in persuading patients to resume its use."

In the days preceding the publication of the British Pharmacopœia it is probable that a considerable source of inaccuracy in dosage arose from the unequal forms in which the medicine was dispensed and the extreme difficulty of calculating their relative strengths. All this has for us only a historical interest, as at the present time we are sure of getting accurately-made preparations, and we never have to complain, as Blackall did, of digitalis becoming inert from the "powder being kept in paper, or in a bottle which was often opened for use." The tincture is the preparation usually employed, the standard dose for an adult being 10 minims three times a day, in which amount it is perfectly safe and manageable, but if given more frequently its cumulative effect may be produced, the pulse dropping suddenly, so that this dose should not be exceeded unless the case is carefully watched. Nor is there much reason to complain that these doses irritate the stomach, unless marked gastritis is present, when it is better to choose some other method of administration, as in pills containing the powdered leaves; but the best form in these circumstances is Nativelle's granules of digitaline, which are free from any irritating action on the stomach, and are therapeutically most efficient.

The general indication for the use of digitalis is a weak, rapid, and irregular pulse, or the presence of edema. The much-debated question of its utility in aortic disease has not been settled by Foster's discovery that when it slows the heart the prolongation affects the diastolic period more than the rest of the cardiac cycle, as when the heart's action is slowed from any cause whatever the diastolic period is lengthened disproportionately. In all cases of aortic disease the pulse should beat more quickly than normal in order to keep up the circulation; but so long as digitalis does not reduce its rate below 80, the good effects are as apparent in aortic disease as in other conditions.

Strophanthus has the same action as digitalis, but is not more manageable or trustworthy. On its first introduction the writer used various preparations of it with unsatisfactory results, and a small quantity of a tincture prepared by Professor Fraser, which acted very well, but was not enough for extended operations. On Professor Fraser's recommendation the writer procured Duncan and Flockhart's tincture, but this proved to be no better than the others. He then obtained a sample of strophanthus seed and sent it to Professor Fraser, who pronounced it to be not *Strophanthus hispidus*, but some other species, yet he was assured that it was the only seed at that time in the English market, from which all the tinctures in use were prepared! This led the author to give it up, but some years afterward he had all the specimens in the market reëxamined, and all were genuine and active. He uses it occasionally when digitalis fails, but knows of no indication for giving preference to it.

The author has used the tincture of convallaria in advanced cases of aortic disease, giving it in 15-minim doses in combination with caffeine or theobromine, in which form it has answered his purpose very well, but he is unable to speak of its action by itself.

After digitalis the most useful cardiac tonics are caffeine and theobromine, whose chemical composition and therapeutic action are nearly identical. Caffeine citrate in 5-grain doses may be kept in solution by adding a little citric acid, but theobromine in the proprietary form of diuretin—a double salicylate combined with sodium, of which the dose is 10 grains—has the advantage of being soluble, while a similar double salt of caffeine prepared for him did not possess this useful property. Both are good stimulants to the heart and also true diuretics—that is to say, they act not merely by increasing its water-secreting apparatus. Of their value in combination with digitalis he has no doubt.

Nux vomica and its alkaloid strychnine are powerful heart tonics, especially in the form of strychnine injections, which should not be postponed until the patient is *in extremis*. These injections will relieve heart pain when other remedies have failed, and their use can be combined with that of other

cardiac tonics given by the mouth. The usual dose is 5 minims, to be injected every four hours, but this quantity should be increased and the action pushed in desperate conditions, adding one minim at a time to the quantity and diminishing the interval to three or two hours.

THE SALT-FREE TREATMENT OF EPILEPSY.

In the *New York Medical Journal* of October 20, 1906, GORDON reports his experience with this method. His study of thirty-seven cases led him to the following conclusions:

Sodium chloride plays undoubtedly an important rôle in the chemistry of the organism. The suppression of alimentary salt in the diet of epileptics has a favorable effect on epileptic seizures inasmuch as it reduces their frequency and their severity. It is of the same value in the treatment of epilepsy as the strict observance of dietetic and hygienic rules. Both factors combined aid considerably in reducing and controlling the seizures. Reduction or complete removal of sodium chloride from the diet gives better results while bromides are taken than while they are not taken. The fact that suppression of alimentary salt puts in action the chloride molecules of the organism, that the elimination of various products of metabolism, such as urea, is *ipso facto* facilitated—this fact, the author asserts, is highly corroborative, if not absolutely so, of the toxic pathogenesis of epilepsy. That there is a hypertoxic underlying basis had been proved beyond doubt by various investigators. Suffice it to mention among recent writers Jules Voisin, Peron, and R. Petit.

An uncomplicated experiment led the author to the same conclusion. To some of his patients who happened to have attacks at regular intervals he administered methylene blue a few hours before a seizure. During the convulsions the urine which they voided involuntarily was clear, but the greenish-blue color began to appear after the seizures. This experiment naturally leads to the idea of retention of poisonous material in the organism and to a general intoxication of the tissues. The nervous phenomena of an attack are the consequences of an intoxication which reached its maximum.

The studies on the rôle of sodium chloride are of great value. Their application to other pathological conditions, such as ascites, edema, cirrhosis of the liver, and cardiac and renal diseases, is now well known. It is gratifying to utilize this knowledge in the therapeutics of nervous diseases, in the presence of which we feel frequently powerless. Dechlorization is certainly not a specific for epilepsy, but it adds a new element to our meager neurological armamentarium. It also adds considerable value to our old conception of epilepsy as a disease in which faulty chemical processes play an enormous rôle.

INJECTIONS OF ALCOHOL IN NERVOUS AFFECTIONS.

The medical profession is beginning to recognize the efficacy of injections of alcohol in the treatment of at least two conditions hitherto considered rebellious to therapeutic methods, viz., trigeminal neuralgia and facial spasm. In a communication made to the Neurological Society of Paris on July 5, M. Brissaud, M. Sicard, and M. Tanon gave interesting details of the application of the method to various other conditions usually accounted hopeless. The contact of one or two cubic centimeters of alcohol (70 to 80 per cent) with the actual conducting fibers of a nerve trunk is followed by the diminution or disappearance of sensory or motor spasmodic phenomena in the distribution of the trunk. This procedure, however, is to be avoided where there is any neuritis or other inflammatory process at work, and its use in cases of sciatica has merely aggravated the symptoms. On the other hand, in the contracture of hemiplegics and paraplegics, where spontaneous clonus is a distressing complication, in certain cases of athetosis, in spasms of the muscles of the neck, and in cramps arising

from profession or occupation, the writers have obtained singularly good results. It is true no one of their cases has as yet been under observation for longer than two months, and therefore conclusions may be somewhat premature, but notwithstanding this reservation the significance of the facts cannot be neglected. Preliminary experimentation on animals made it clear that the injection of alcohol into the sciatic nerve was succeeded by transient paresis or paralysis in the leg and foot, accompanied by the reaction of degeneration in the muscles involved, and histological examination showed the presence of Wallerian degeneration beyond the site of the puncture. Weaker solutions (30 or 40 per cent) did not produce any motor impairment, but again degenerated fibers were found in the nerve trunk.

A commencement of the application of this method in man was made with certain cases of contracted foot in hemiplegia. At a point just below the exit of the sciatic from the pelvis two cubic centimeters of 80-per-cent alcohol, with the addition of rather less than a centigramme of stovaine for each cubic centimeter, was injected into the nerve. Immediately after the injection the patient had a sensation of heat and of heaviness in the leg, and the skin of the foot was seen to be reddened and felt warm to the touch; there was a certain amount of tactile anesthesia on the outer side of the leg, there was paresis of the toes, dorsiflexion was weak, and the tendo Achillis jerk was entirely abolished. In particular, all clonic and spasmodic movements of the foot vanished. Two months later the condition remained the same except that the paresis was less, the paresthesia had begun to diminish, and the anesthesia had disappeared. There was no indication either of trophic disturbance or of alteration in electric excitability. The writers propose to continue their researches in the domain of other nerve trunks, and with further experience the technique will no doubt be improved and the dosage standardized.—*Lancet,* Sept. 22, 1906.

SOME REMARKS ON THE THERAPEUTIC ACTION OF THE IODIDES.

BURNET writes on this topic in the *Lancet* of September 8, 1906.

In the course of his paper the author discusses the employment of iodides in cases of angina pectoris. He is of the opinion that to be of any real service the patient should have from 30 to 60 grains per day, and that this administration should be kept up for months. A patient under his care some time ago for the disease was given one and a half drachms of iodipin in warm milk three times a day for periods of a month with a week's interval between for a year. During that time he had no attack, although previously he had one on an average every four or five months. Huchard, whose knowledge of heart affections must be considered very extensive indeed, did not hesitate in severe cases to give as much as from 12 to 15 or even 20 grammes of iodide of potassium in a single day. This may be by some regarded as heroic treatment, but in the author's opinion it was fully justified by the results obtained. Arteriosclerosis, which is so often present in these cases, is not necessarily a source of heightened blood-pressure. Rolleston points out that the iodides in such cases act by stimulating the secretion of the thyroid and not by their depressant effect upon the circulation. In this connection he refers to a paper by A. Fraenkel, in which he says that the pathology of angina pectoris is to be found in a sclerosis of the coronary vessels, the angina occurring in the course of syphilis, gout, and aneurism being due to this. In other cases a spasm of the smaller vessels of the heart produces an anemia and the pain thereupon ensues. This spasm, which is probably the source of every attack of true angina, is relieved by the use of iodides, of which the author prefers the sodium preparations as less likely to interfere with digestion. This view of the treatment of angina by means of iodides is a very rational one, and is to some extent in accordance with the author's opinion, to which he presently refers—namely, the

iodides relieve angina by their specific antispasmodic action.

Passing now to the consideration of the therapeutic action of the iodides in cases of respiratory disease, we find ourselves on less uncertain ground. It is with this sphere of their action that the author is most familiar. In chronic diseases of the respiratory system he knows of only two or three remedies which may be absolutely relied on, and one of these is the iodide of potassium. Some three years ago, while the author was engaged in making a series of observations on pulmonary fibrosis as met with in stonemasons, he found that the two drugs which were of most value were iodide of potassium and ichthyol. With these two remedies alone he was often able to alleviate the symptoms very materially indeed. When the dyspnea which in such cases generally results from emphysema becomes a marked feature of the case, then iodides given regularly over a somewhat prolonged period almost always afford relief from this distressing symptom.

BLACKWATER FEVER DUE TO ADMINISTRATION OF QUININE.

The question whether blackwater fever can be induced by administration of quinine has been much discussed. In the *South African Medical Record* Dr. A. D. Ketchen has reported the following important case, which appears to be conclusive: An Austrian, aged twenty-eight years, was admitted into the New Somerset Hospital, Cape Town, on April 17, 1906. He gave the following history: In March, 1903, he was first attacked with malaria when in East Africa. Under Koch's treatment (one gramme of quinine every ninth and tenth day) the symptoms disappeared in two months. In November, under the influence of fatigue and privation, the fever recurred. One morning when his temperature was rising he took quinine, and after half an hour he passed very dark urine. Under diluent drinks the urine became clear in twenty hours. When the temperature had been normal for two or three days he again took quinine, and the black water recurred. Afterward he had short malarial attacks, but did not take quinine. Then a severe attack, in which the temperature rose to 106.7° F., occurred. When he recovered his medical adviser told him to take quinine again, beginning with a small dose and gradually increasing. On taking about one-tenth of a half-gramme tablet (about three-quarters of a grain) black water occurred in half an hour. Later he took one-fortieth of a tablet, with the same result. For the fourteen months preceding admission he had had no more malarial attacks, but he suffered from dysentery.

On admission he was somewhat spare and anemic. The spleen extended four inches below the ribs. There was slight dilatation of the heart, and the first sound terminated in a soft systolic murmur. The liver was slightly enlarged. The urine did not contain albumin or blood. The temperature was normal. He was kept in bed, given iron and arsenic, and dieted for the colitis. On the 20th a blood-film showed one or two parasites of the estivo-autumnal type. On April 23, at 8 A.M., by mistake he was given 10 grains of ferri et quininæ citras (containing about one and one-half grains of quinine). At 10 A.M. he noticed that the urine was black, and concluded that he had taken quinine. At 6 P.M. the temperature was 102°. Ignorant of the facts the house physician prescribed 10 grains of quinine, which was given at 11 P.M. At 10 P.M. the urine was clear and the temperature had fallen to 99.4°. At 2 A.M. on the 24th the temperature was 104.2°, he had a rigor lasting twenty minutes, and vomited. When seen in the morning the skin was of a saffron color and the conjunctivæ were yellow. He had been sweating profusely. The urine was black and contained albumin and casts. The temperature rapidly fell and on the 25th was normal, when the yellow color had almost disappeared and the urine was clear and contained a trace of albumin. On the 26th six grains of quinine were given at 6 P.M., and at 10 P.M. the temperature had risen to 102°, and he was again passing black water with the same

symptoms as before. Under a liberal diet, iron, and arsenic he rapidly improved. As doubt was expressed that so small a quantity of quinine as that contained in ten grains of ferri et quininæ citras could cause an attack this dose was given at 8 A.M. on May 8. At 10 A.M. he was passing red urine, and at 6 P.M. the temperature was 104.2°. The blood showed no parasites. On the 14th he left the hospital much improved in general condition, but without diminution in the size of the spleen.—*Lancet*, Sept. 22, 1906.

GALL-STONES AND GALL-BLADDER DISEASES FROM THE STANDPOINT OF THE PHYSICIAN.

In the course of an article upon this subject contributed to the *Journal of the American Medical Association* of September 22, 1906, BRIDGE asserts that all cases of proven gall-stone or gall-bladder trouble are proper subjects for surgical consideration, whether they are to be regarded as surgical cases or ever come to operation. Whether operation is to be done or not, when conditions do not sound the insistent need of an operation, or the patient declines, or the physician sees reasons against an operation, proper medical treatment should be instituted always, and persistently carried out. This is as true of the gall-stone troubles as it is of those of the appendix.

What are such measures? In the acute cases there should be absolute rest of the body. Rest of the stomach and bowels to the extent of starvation for some days is best, especially when peritonitis is present or threatened. Nutrient enemata may be allowed tentatively, but never nutrition by the stomach in such cases. The upper abdominal organs must be kept still, not shaken about by peristaltic movements. During the initial pain it is always best to evacuate the stomach promptly, and for this purpose an emetic of sulphate of zinc is perhaps better than the stomach-tube, since it tends to relax spasm, and often evacuates food contents that could not pass through a tube. Enemata are best to evacuate the bowels in the acute cases. After starvation begins the bowels accumulate little fecal matter and give little trouble. General measures to sustain the powers of life, as nutrient enemata and perhaps hypodermic injections of strychnine, are always in order after a few days of the starvation. Perhaps there is some benefit to be expected from hot poultices or ice-bags over the epigastrium. It is much to be regretted that our views of the exact effect and value of these measures should not be more settled and unanimous than they are; some of us prize the hot applications, some use the cold, while others deny the value of either.

In the subacute and chronic cases the daily full flushing of the bowels by alkaline laxative waters is useful, but it is irrational to suppose that gall-stones are thus washed away. Nor does olive oil or any other of the pretended expulsive agents have the smallest effect. The thing that happens is probably merely the elimination of effete matter from the body, thus increasing the physiological resisting power. This process is aided by a restricted diet of the most proper foods and by general good hygiene. It is the custom in Europe to send patients with chronic gall-tract diseases to some of the spas (mostly to Carlsbad) for a course of the waters, to see if an operation can be avoided by the appearances of recovery. These measures are all useful, for the patient gets the benefit of an abstemious regimen, for a time at least, in addition to the waters, and thus is frequently able to improve in a marked manner.

To go to the springs, drink freely of water and live on a low diet, be much out-of-doors, and rest from work and perhaps from cares, are always wholesome for these cases. Such a vacation can be taken once or twice a year with great propriety, but it has little power to postpone the day of a final surgical operation or death if on returning home the patient goes back to his former habits of overfeeding, irritation of stomach, lack of depuration, and generally unhygienic life. This latter is just what a large number of patients are constantly doing. By this course they invite infection

from irritating things in their gall-tracts and so hasten surgical intervention. This last is no misfortune if the surgery can be done at the right time and under the best conditions; but they usually regard it as a misfortune, and think they are fighting it off by their occasional water cures.

The only proper course for such patients, who would be fairly well and avoid surgery, is to live lives of absolute regularity and abstemiousness, be rigidly temperate in everything except the use of water, and hygienic and moderate in every day's living. One day of overdoing, overeating, or overdrinking, or of severe chilling of the body, may start an infection and precipitate an acute attack that will destroy life unless prevented by timely surgery.

DISINFECTION BY FORMALDEHYDE.

A valuable contribution to the subject of disinfection by formaldehyde forms the substance of a paper by Mr. Daniel Base, of the Division of Pharmacology, Hygienic Laboratory, United States Public Health and Marine Hospital Service, which is published in the *Journal of the American Chemical Society* for August. The investigation was undertaken in order to determine the amount of formaldehyde gas given off into a room, specially designed for the purpose, from a definite volume of formalin by five well-known methods, and to fix the relative value of these methods as to the yield of formaldehyde gas. The methods compared were: (1) The permanganate-formalin method, by which formalin is poured upon crystals of potassium permanganate; the reaction is completed in about five minutes. (2) The autoclave method, whereby an autoclave is first charged with a definite mixture of formalin, glycerin, calcium chloride, and water; the pressure is then raised to between 50 and 60 pounds, the cock is opened, and the ejection continued until the pressure falls to about 20 pounds; the pressure is then again raised and the process repeated so long as vapor continues to escape from the nozzle of the autoclave. (3) The sheet-spraying method, which simply consists in hanging up in a room two large sheets at an angle of about 45°, dampening them and spraying them uniformly with a given quantity of formalin. (4) The Kühn lamp method, based on the generation of formaldehyde by the partial oxidation of methyl alcohol. (5) The Trenner-Lee retort method, by which formalin is simply heated to the boiling point in a retort in such a manner that the issuing formaldehyde gas and water vapor are passed into the room. The results obtained must be interpreted as representing the quantities of formaldehyde gas that may be expected to be present in a fairly air-tight room on a fairly still day, and after a certain interval of time which varies with the method used.

According to the volume of formaldehyde yielded Mr. Base arranges the methods in the following order: (1) the Trenner-Lee retort method, which gives the best yield; (2) the autoclave method; (3) the permanganate-formalin method, in the proportion of 300 grammes of the salt to 600 cubic centimeters of formalin; (4) the sheet-spraying method; (5) a modification of (3), consisting in the addition of 300 cubic centimeters of water to 375 grammes of potassium permanganate and 600 cubic centimeters of formalin; and (6) the Kühn lamp method.

For simplicity and expedition Mr. Base regards the permanganate-formalin method as preferable to all the others. The yield of formaldehyde gas can easily be increased by using larger quantities of materials. Although the sheet-spraying method does not give at any time so high a percentage of the gas, it has the advantage that a uniform amount of gas is kept up for a long time. On the other hand, the modified permanganate-formalin method yields a constantly diminishing quantity of gas, which after five or six hours is less than is obtained by the sheet-spraying method. By the autoclave method there is a loss of formaldehyde in the autoclave by polymerization or decomposition. The Trenner-Lee retort method, although yielding appreciably more gas than the autoclave, requires more than twice the time to exhaust the apparatus.

With the Kühn lamp the yield of formaldehyde is low; but this method possesses the merit of producing more moisture in the air of the room than the other methods described. This point is of importance, since it has been stated by M. von Brunn and others that it is preferable nearly to saturate the air of the room with moisture in order to favor the condensation of the formaldehyde on the various objects in the room. Mr. Base suggests that a greater degree of humidity in the air can be readily obtained with the permanganate-formalin method by using an ordinary tin or copper still.

Finally, Mr. Base quotes the conclusions of a recent experimenter as to the practical requirements for an effective formaldehyde disinfection: (1) Five grammes of formaldehyde (absolute) should be present in each cubic meter of space (0.1416 gramme per cubic foot), and should be allowed to act for seven hours; (2) the temperature of the room should not fall below 50° F., the best temperature being from 68° to 77° F.; and (3) the strength of the formalin should be ascertained.—*Lancet,* Sept. 29, 1906.

ANGINA PECTORIS.

GIBSON writes on this topic in the *Practitioner* for September, 1906. He asserts that the first duty of the physician, when called to see any one suffering from a paroxysm of angina pectoris, is to relieve it with as little delay as possible. Seeing that in the majority of cases the condition is associated with at least a relative high arterial pressure, drugs which lessen the resistance are of great importance. The most useful of these are the nitrites and the iodides. The nitrites of amyl and butyl —more exactly isoamyl and isobutyl—have long had a well-merited vogue for relieving the symptoms. Amyl nitrite is preëminently useful, and when administered in a dose sufficient to produce well-marked physiological effects it cannot be surpassed. Butyl nitrite, although of more recent introduction, and therefore of less assured utility, appears to produce very beneficial effects also. Both may be administered in doses of from three to five minims, the most convenient means of administration being glass capsules. It is difficult, if not impossible, to decide *a priori* the relative utility of these drugs. Their effects are undoubtedly dependent to a greater extent upon personal idiosyncrasies.

Ethyl iodide, otherwise known as hydriodic ether, is also of considerable value, administered by inhalation in doses of five minims; glass capsules containing this dose may be employed. So far as can be ascertained, the action of this drug is due to the liberation of free iodine, which is rapidly absorbed by the blood. It is impossible to foretell in any given case whether the nitrite or iodide series will be most useful, and the value of these drugs can only be judged by their results. It is unfortunate that all of them frequently leave headache and giddiness behind them. A very serviceable combination is supplied in capsules of ethyl iodide and chloroform, each containing five and ten minims respectively of the two drugs. The chloroform has certainly, in the author's experience, lessened the discomfort produced by hydriodic ether.

The exhibition of powerful alcoholic stimulants by the mouth is often urgently called for; brandy, whisky, spirit of ether, spirit of chloroform, and aromatic spirit of ammonia are all eminently useful in this connection. It may even be necessary to give the patient such general anesthetics as chloroform or ether by inhalation. Sometimes the subcutaneous administration of morphine is absolutely necessary. The application of heat to the chest externally is often useful, and respiratory movements certainly alleviate the suffering in many cases. It need hardly be added that the patient must be placed in such a position as will be most easy and comfortable, while an abundant supply of fresh air must be secured. If the sufferer can be induced to inspire deeply, he will often obtain relief.

When we consider preventive treatment, we find it necessary to lay down full directions regarding the general measures to be followed. The diet must be so regulated

as to prevent any digestive embarrassment, particularly flatulent distention; the fluid must be ample, so as to insure proper metabolic changes, but it should not be given with meals; sufficient exercise must be enjoined, so as to stimulate not only the muscles but every other part of the body; adequate rest should be secured, so as to provide for recuperation; occupation must be provided, in order to prevent the mind lingering upon the distressing symptoms of the affection; sleep enough to provide for complete restitution of every system will have to be insured—these general measures will require full attention, and many little details, which cannot be mentioned here, will demand sedulous care.

Respiratory movements cannot be overestimated; their value for those able to take advantage of them is very great. In certain cases, however, when the patient is unable to take active exercise, massage must be adopted. With regard to such matters, it is the author's conviction that the Swedish system of massage and exercises is very much more useful than any other method.

THE NATURE AND TREATMENT OF ANGINA PECTORIS.

In the London *Practitioner* for September, 1906, BARBER has an article bearing this title. He thinks that in a severe attack of angina pectoris, amyl nitrite must be inhaled at once; a capsule, containing three or five minims, should be broken in a handkerchief and the vapor inhaled; if this fails to relieve in a minute or two chloroform may be tried, which is best administered, on a sponge, in a smelling bottle, by the patient himself; and for pain which is persistent, morphine, gr. ¼ hypodermically, is required, which in a feeble patient may be counteracted by the injection of liquor strychninæ hydrochloridi min. iij. At the same time, if at hand, the following stimulant should be taken:

℞ Spiritus ætheris, min. xxx;
Spiritus ammonii aromatici, min. xxx;
Aquæ camphoræ, q. s. ad ℥j.

Or failing that f℥ss of brandy.

As an alternative for amyl nitrite, one or two minims of liquor trinitrini (B. P.) or one or two of the tabellæ trinitrini (B. P.) may be taken. Amyl nitrite usually acts more promptly, but in some cases one of these latter will relieve where amyl nitrite fails. Sodium nitrite, in two-and-a-half-grain tablets, is recommended for pain that is not readily relieved by the above nitrites; the dose is one to four tablets.

Erythrol tetranitrite, one grain in alcoholic solution, is said to be more lasting, and is therefore useful in cases in which there is quick recurrence, and the same may be said, to a less degree, of sodium nitrite. Of other vapors recommended, iodide of ethyl, bromide of ethyl, and pyridine are the most common, and may be tried in intractable cases; the last is most objectionable, and it is not usual to require any of them. In mild cases, or for pain persisting after the attack is much relieved, hot applications to the precordium are often comforting. When the attack is relieved the patient should rest, avoid all exciting causes, and confine himself to a very light diet; probably for the remainder of that day, at any rate, a strict milk diet, and arrowroot, is the best. Alcohol is best avoided, unless absolutely necessary.

When these attacks have been declared, a course of nitrites is often very beneficial; let the patient take:

℞ Liquor trinitrini, min. j;
Tincturæ cardamomi compositi, min. xxx;
Spiritus chloroformi, min. x;
Aquæ, q. s. ad f℥j.

Sig.: Take at one dose when needed.

Professor Osler recommends that the dose should be gradually increased, every five or six days, till headache and flushing are produced. The nitrites may be taken for several weeks; perhaps the most difficult cases are those in which there is a tendency toward failure of compensation of the heart, as the liquor trinitrini may increase this, and the administration of digitalis may bring a return of pain. These patients must be kept in bed or on a couch while the liquor trinitrini is given, and instead of digitalis, caffeine and nux vomica may be used:

℞ Liquor trinitrini, min. j;
Caffeinæ citratis, gr. ij;
Tincturæ nucis vomicæ, min. viij;
Syrupi aurantii, ʒss;
Aquæ, q. s. ad fʒj.
Sig.: Take three times daily.

The diet should be of a light farinaceous character. Eggs lightly boiled and fish may be allowed; but in severe cases peptonized milk, or milk and barley water only, should be taken for a short time.

To Avoid Attacks.—The most important point for the patient who is liable to angina pectoris is the regulation of his life in such a way that he may avoid all forms of exciting cause. The exciting causes are very variable; probably the most common are physical exertion and distention of the stomach, and perhaps emotion should come third. Hurrying for a train, walking fast up-hill, all forms of exertion, especially after food, must be avoided. Mental excitement, business worry, anger, or emotion of any kind may set up an attack. Exposure to cold—bathing, for example—substances that have a toxic action on the heart, as tea, tobacco, coffee, and alcohol, are all exciting causes which must be guarded against. An even, quiet life, free from excitement, with plenty of fresh air, and very gentle exercise, is what is needed; warm clothes in the winter, and for the proper action of the skin warm baths, are required.

The diet should consist of white, boiled fish, eggs lightly boiled, and milk puddings; fresh meat may be allowed, and is best underdone. Plenty of water, or some mineral water, should be taken. Vegetables, and other articles likely to cause flatulence, must be avoided. The meals should be taken regularly, and no supper allowed. The bowels must be kept acting regularly by a so-called "dinner-pill" of aloes and nux vomica; or an occasional dose of calomel, gr. ½ or 1, followed next morning by Carlsbad salts ʒj, may be taken. A digestive tonic may at times be beneficial—for example:

℞ Sodii bicarbonatis, gr. xx;
Tincturæ aurantii, min. xx;
Infusi calumbæ, fʒss;
Aquæ chlorôformi, q. s. ad. fʒj.
Sig.: Take three times a day after meals.

Or,

℞ Acidi nitrohydrochlorici diluti, min. x;
Tincturæ nucis vomicæ, min. viij;
Tincturæ aurantii, min. xx;
Aquæ, q. s. ad fʒj.
Sig.: Take three times a day after meals.

Of drugs which may have a curative action, potassium iodide, in large doses (gr. x to xx, t. d. s.), is very strongly recommended by Sir Lauder Brunton in arterial degeneration. It is administered, of course, freely diluted with water, to prevent iodism, and its effect must be carefully watched. Arsenic and strychnine combined have given benefit in some cases:

℞ Liquor strychninæ hydrochloridi, min. iij.
Liquor arseni hydrochloridi, min. iij;
Tincturæ aurantii, min. xx;
Aquæ, q. s. ad fʒj.
Sig.: Take three times a day after meals.

Potassium bromide, in neurotic cases, is very beneficial and may be added to the alkaline digestive tonic prescribed above. Where both anemia and valvular disease of the heart are present, digitalis and iron may well be combined:

℞ Tincturæ digitalis, min. x;
Liquor ferri perchloridi, min. xv;
Acidi citrici, gr. v;
Syrupi limonis, min. xxx;
Aquæ destillatæ, q. s. ad fʒj.
S.: Take three times a day after meals.

It must be remembered that digitalis may increase the pain, and if arterial tension is high, caffeine citrate and nux vomica will be better. It has been stated that cocaine will prevent the occurrence of angina pectoris, but probably it is not a safe remedy.

In some cases, in which there have been premonitory symptoms, the application of the constant electrical current over the vagus in the neck has effectually warded off the attacks.

For the treatment of the other varieties of pain, not true angina, the main indication would be to avoid the poison in toxic angina; to give general tonic treatment and bromide of potassium in pseudoangina; and rest, with sometimes nitrites, in valvular disease of the heart. In all these cases the diet will require careful regulating. The treatment of angina, associated with an

aortic aneurism, or aortic regurgitation from atheroma of the valves, requires no special comment, though the prognosis is more grave.

The great essentials, then, in the treatment of angina pectoris are a quiet life, a wise diet, and the administration of nitrites in an attack. A patient subject to angina should carry amyl nitrite capsules, or the tabellæ trinitrini.

THE TREATMENT OF TETANUS.

For many years the treatment of tetanus has aroused the interest both of the practicing physician and of the experimenter. A disease of strikingly definite character produced by an organism or its products which is known offers a field for study which undoubtedly in time will be crowned with success from the standpoint of treatment. An interesting, concise discussion of the general subject from a somewhat new point of view appears in the current number of *Surgery, Gynecology, and Obstetrics,* by Dr. C. A. Porter, of Boston, being a paper read at the last meeting of the American Surgical Association.

Our present knowledge of the action of tetanus toxin is essentially as follows: Diffused from the local lesion the toxin enters the motor nerve plates of the muscles and passes thence within the axons of motor nerves toward the motor ganglia in the cord. The toxin also enters the general blood current, whence it is either excreted or destroyed, or indirectly conveyed again to the nerve structures. The poison shows a strong tendency to enter into combination with the higher central ganglia, and on this fact is based the possibility of a rational treatment. The fact should also be recognized that antitoxin ascends the axons more slowly than the toxin, and therefore it must be introduced at a higher level than the toxin, and before stable union between nerve and toxin has occurred. Dr. Porter on the basis of these generally accepted principles finds the following indications for treatment: (1) To anticipate the centripetal course of the toxin by an immunizing injection at a higher level; (2) by local injections of antitoxin, to neutralize the toxin at its upper limit of advance; (3) by intravenous or subcutaneous injections, to neutralize all circulating toxins; (4) to prevent or retard, so far as possible, lymphatic absorption from the focus, and by local parenchymatous injections to render the poison inert; (5) by amputation or excision, with germicides, etc., to remove the source of infection when it is possible; and (6) by symptomatic treatment or the newer anesthetic treatment, cocaine, etc., or magnesium sulphate, to aid the specific serum.

Dr. Porter contends that if the view be true that antitoxin never reaches nerve tissue unless directly injected into it, it follows that cerebrospinal lymph sac injections are useless. Lumbar puncture and subarachnoid injections are presumably inefficacious, and the direct injection of the antitoxin into the cord is obviously too dangerous a proceeding to be attempted except in the most desperate cases.

The suggestion is made that injections might be made into the higher peripheral motor nerves, as, for example, the hypoglossal nerves and the brachial plexuses. This would be a far less dangerous procedure than injections into the substance of the cord. The surgical difficulties are relatively slight, and inasmuch as injections are indicated as near to the cord as possible the nerves should be exposed near their origin and their substance directly injected. As a still more radical procedure it is suggested that in certain cases nerves should actually be sectioned to prevent the passage upward of tetanotoxin. The general treatment suggested is summarized as follows:

1. Immediate intravenous and subcutaneous injections to neutralize circulating toxin.

2. Immunizing or neutralizing injections at the highest level which the severity of the symptoms appears to justify; directly into the cord, as advocated by Rogers, or into the higher motor nerves, such as the hypoglossal and spinal accessory, as suggested by the author.

3. Peripheral intraneural injections as near to the cord as possible. Where amputation is not indicated or allowed, there is positive experimental evidence that nerve section will isolate the toxins in the limb.

4. Lymphatic absorption will be diminished by the application of Bier's principle of passive hyperemia or by circumcision of the limb.

5. Parenchymatous injections, especially into the muscles, may be found of distinct value in addition to subcutaneous and intravenous injections.

6. If possible, the local focus should be thoroughly eradicated.

7. We have no right to neglect symptomatic treatment.

8. Animal experimentation gives us no ground for hoping that any treatment whatever can be successful, when once the disease has progressed beyond a certain stage.

The foregoing opinions of Dr. Porter on the basis of a careful study of the literature are highly suggestive and indicate an apparently rational mode of treatment which has hitherto been overlooked. Unfortunately Dr. Porter is unable to substantiate his claims at the present time by an array of cases from which the ultimate test must naturally come. The means of treatment, however, apart possibly from the somewhat radical sectioning of nerves, is one which may be tried without danger, and which certainly should receive the careful consideration of those into whose hands cases of tetanus may come.—*Boston Medical and Surgical Journal,* Sept. 6, 1906.

METHYLENE BLUE IN THE TREATMENT OF INOPERABLE CANCER.

Dr. A. Jacobi, of New York, in a discussion before the Medical Society of the State of New York, January 30, 1906, said that all physicians, no doubt, were called upon sometimes to treat inoperable cancer. His experience ran back fourteen or fifteen years and involved a large number of cases which the surgeon would not touch. These patients, he said, could be made comfortable, and some might be restored, at least temporarily, to a certain amount of health and efficiency by internal treatment. Fourteen or fifteen years ago Moorhof-Mosetig in Vienna recommended the use of aniline dye, methylene blue, in inoperable cancers. At that time it was used subcutaneously. In America, Dr. Willy Meyer was, Dr. Jacobi believed, the first to write on this subject. Dr. Jacobi said this method of using it was very painful, and therefore but little success attended its use. Later he had used methylene blue internally. When he had to treat an inoperable cancer, particularly of abdominal organs, or in cases in which operation had been refused, he gave methylene blue, in pill form, a half grain four times daily in the beginning, and increasing up to four, five, and six grains a day. From the very beginning, in order to counteract the disagreeable dysuria, he gave extract of belladonna, three-fourths of a grain a day, divided into three or four doses. It acts very much better than nutmeg, which has been recommended for that purpose. Under such treatment the cases have done well, particularly the intra-abdominal cancers. In cases of cancer of the liver, after using this treatment for some time, he has seen autopsies performed, and the tumor found to have been much reduced, the patient having lived for a good many years in tolerable comfort. He had had one case under observation eight years: this patient is now attending to his business all the time. He would recommend this treatment, too, in cases that have been operated upon, as a routine measure. This plan of treatment he brought before the society because there are so many of these cases. Frequently he has combined the methylene blue with arsenous acid, a preparation which he considers better than Fowler's solution. It could also be given with strychnine, or anything one pleased. It is important that the pills should be made up by a good apothecary. The dosage of the methylene blue should be gradually increased from two up to six grains daily, and even more, divided into four doses.—*New York State Journal of Medicine,* September, 1906.

SERUM TREATMENT OF TUBERCULOSIS OF THE BLADDER.

The experiences reported by KEERSMAECKER (*Annales des Maladies des Organes Génito-urinaires,* No. 13) were in women of early adult life of the poorer classes. He found that no treatment, either local or internal, had any influence on the tubercular lesions, although a mixed infection could be gotten rid of by the usual antiseptics. After using the "filtered bouillon" of Professor Denys he has cured a series of cases. He begins with a 1:1000 and increases to 1:100 and 1:10. He reports twelve cases: three of vesical lesions only were cured, two of renal alone were greatly improved, and of seven cases with lesions of the bladder and kidneys, five were cured or almost so at present.

PRIMARY SARCOMA OF THE STOMACH.

M'CORMICK and WELSH (*Scottish Medical and Surgical Journal,* October, 1906) report two instances of primary sarcoma of the stomach—both successfully operated on, both over fifty years of age.

A third case is appended, occurring in a man forty years old, the diagnosis having been made post mortem. Authorities are quoted to the effect that more cases of primary gastric sarcoma are reported over seventy than under ten years of age, and there are just as many between the fiftieth and seventieth as between ten and thirty, the maximum incidence falling between the fortieth and fiftieth year. They state that the perfunctory classification of malignant growths as sarcomata when they arise in the young, and as cancers when they arise in later life, is a convention much to be deprecated.

The round-cell forms frequently spread in the pyloric half of the stomach, and frequently manifest themselves as diffuse infiltrations of the stomach wall. There is usually no stenosis of the pylorus, the orifice being kept open by the rigidity of the walls, but the cardiac end is often dilated. The bulk of the growth is encountered in submucous tissue. This form of growth rarely gives rise to a globular tumor projecting from the stomach wall. The general symptoms are like those of carcinoma in the same region, and the chemism is modified in the same way. The disease is fairly rapid in its course and there is a tendency to glandular infection.

Spindle-cell sarcomas generally spring from the body of the stomach near the greater curvature, and often from its posterior wall. They take the form of localized growths which project from the outer surface of the stomach. As they increase in size they frequently become pedunculated. They form adhesions with adjacent structures. These forms display a relatively limited malignancy, though secondary growths have been recorded, particularly in the liver. Stomach symptoms are characteristically absent in the early stages. Even later when a firm, rounded, freely movable tumor can be felt there may be nothing in the clinical history to attract attention to the stomach. The majority of successful operations have been accomplished in regard to the growths of the spindle-cell group.

VALUE OF INDIGO-CARMINE TEST AS AN AID IN THE DIAGNOSIS OF PARTIAL AND TOTAL URETERAL OCCLUSIONS.

BEER (*Annals of Surgery,* October, 1906) sees in the hypodermic administration of indican-carmine in sterile aqueous solution a most valuable aid in the diagnosis of ureteral obstruction, holding that the cystoscopic study of the behavior of the ureteral orifices does not suffice for the formation of a diagnosis even when combined with ureteral catheterization, and that these two means of exploration combined with the indigo-carmine test give conclusive evidence.

Illustrative cases are cited showing how apparently complete obstruction of the ureter did not exist after injection of 30 minims of a concentrated aqueous indigo-carmine solution and cystoscopic examination.

PERFORATIVE GASTRIC AND DUODENAL ULCER.

MILES (*Edinburgh Medical Journal*, September, 1906) reports 36 cases of perforative gastric ulcer and 10 of perforative duodenal ulcer, with a mortality in each series of 50 per cent. Of 19 cases operated on within twelve hours of perforation, over 74 per cent recovered, whilst of 12 operated on in less than thirty-six hours after perforation 8 per cent recovered. Several of the patients were obviously moribund and were only operated upon for what seemed to be the last remaining chance. An occasional case justifies this course. The younger the patient the better the prognosis. Usually there is a previous history of severe indigestion, and in a considerable number of ulceration of the stomach or duodenum. Hematemesis is a rare antecedent symptom. Occasionally perforation occurs in patients who have never hitherto suffered from any digestive disturbance. Symptoms premonitory of perforation are often present. The gastric perforations are usually in the anterior wall. There was a single case of multiple perforation. The most characteristic clinical features were the suddenness of onset and overpowering nature of pain, the marked abdominal rigidity, and the severe degree of shock. Vomiting was not unusually severe at the onset. The persistence of normal hepatic dulness does not negative a diagnosis of perforation. The seat of the greatest area of pain and of tenderness to pressure forms a reliable guide to the seat of the perforation, and therefore to the site of the incision.

The apparent improvement which accompanies the reaction from the initial shock is very deceptive, and apparently the administration of opium adds to the danger, since in 22 cases in which no opium was given 5 patients died and 17 recovered, and in 12 cases in which opium was given 10 patients died and 2 recovered. There is no constant relation traceable between the severity of the peritonitis which ensues and the size or site of the perforation, the quantity or quality of the fluid which escapes from the stomach, the state of repletion of the stomach at the moment of perforation, or any other single factor. Food particles are very seldom recognizable in fluid found in the peritoneal cavity. The abdomen should be opened as soon as possible by a vertical incision, passing between the fibers of the rectus, and usually placed over the site of maximum tenderness.

It is almost never necessary to open the stomach to find the perforation. The suture of the stomach should be reënforced by an omental graft. Leakage is extremely rare. If closure of the ulcer has actually resulted in serious narrowing of the pylorus, gastroenterostomy should be performed. Pyloroplasty in place of gastroenterostomy is in certain cases a simple and efficient alternative. Usually the abdomen should be washed out, a special opening being made above the pubis for the purification of the pelvis and for purposes of drainage. To favor the latter the head of the bed should be raised. The complications encountered by Miles have been temporary gastric fistula, pneumonia, bronchitis, acute non-suppurative parotitis, phlebitis of the leg, pelvic abscess, subphrenic abscess.

ABDOMINAL TUMORS IN CHILDREN.

FISCHER (*American Journal of Surgery*, November, 1906) states that the large proportion of abdominal tumors in early life arise from developmental aberrations. Most malignant growths in early life are sarcomatous. There is a growing tendency to attribute them to traumatism. Certainly some of the kidney sarcomata are congenital. The abdomen seems to be the most frequent location for malignant tumors in children, and usually sarcoma of the kidney. Next in frequency tumors affecting the ovaries and testicles are noted in children, usually before the fifth year. Of thirty-six cases of tumor of the suprarenal body collected by Williams one-third occurred in childhood and were invariably sarcomatous. They may occur in very early infancy. Uterine cancer is rare before the age of twenty.

Lebert and Guersant have both reported a case of epithelioma of the introitus of a girl three and a half years old. Malignant neoplasm of the ovary occurs in infants and young children. In twelve cases operated on by Aldibert, six were children between seven and nine and one only four years old. Malignant disease of the gastro-intestinal tract is very rare in early life. Round-cell sarcoma of the liver has been reported in infants a few times. Many times the tumors are recognized only post mortem. As to general systemic disturbance, often lienteric diarrhea, sometimes constipation, sometimes swelling of lymph glands, usually marked pallor and anemia, are recorded. Hematuria is occasionally noted. Symptoms due to compression are edema of the lungs and scrotum and dilatation of the superficial abdominal veins. At times jaundice, marked leucocytosis, or iodophilia are helpful signs.

KIDNEY AND COLON SUSPENSION BY THE USE OF THE NEPHROCOLIC LIGAMENT AND GEROTA'S NEPHROCOLOPEXY CAPSULE.

LONGYEAR (*American Journal of Obstetrics,* November, 1906) presents a further communication upon the mechanics of kidney displacement. He states that the nephrocolic ligament is formed by an aggregation of fine reticuli originating in and identical with the fibrous tissue forming the framework of the fatty capsule of the kidney, which after enveloping this organ pass downward and are inserted into the posterior wall of the ascending colon on the right side and the descending colon on the left side. He compares it in structure as well as in action to a network covering a balloon (the kidney), the cords of which extend downward to support the car (the cecum). The descent of the kidney is dependent on the laxity of its support and the degree of traction exerted upon it by the cecum. The nephrocolic ligament is a firm and unyielding attachment which is drawn in a downward direction by the cecum, particularly when it is distended with fecal matter and is making violent efforts to unload itself. The action of the colon on the left side is in the opposite direction, as the contents there are forced downward, hence the left kidney is rarely pulled out of its normal position. The downward descent of the right kidney is increased by the pulling of the ascending colon, carrying with it the duodenum, by reason of the adhesion of this intestine to the side of the fatty capsule. This action by causing a kink in the bowel explains the presence of digestive symptoms in cases of prolapse of the right kidney. Prolapse of the left kidney gives practically no symptoms. The nephrocolic ligament is fuller and stronger in cases of nephroptosis of long standing, probably being the result of the long-continued traction to which it has been subjected. The ligament of the left side, though similarly placed, is not so uniformly strong as on the right.

The author's operation, performed ten times, comprises the following steps: An incision two and one-half to three inches long, beginning just outside the quadratus lumborum muscle, at the twelfth rib, and passing diagonally downward toward the ilium, through skin, fat, and superficial aponeurosis to the latissimus dorsi muscle; blunt dissection through the muscle parallel with its fibers; incision and isolation of the transversalis fascia by rat-tooth forceps, one on each side; pushing downward subperitoneal fat; incision of Gerota's capsule and isolation of its edges by tissue forceps, one on each side; grasping and raising nephrocolic ligament with long rat-tooth forceps, directed by the finger against the lower pole of the kidney; gathering up of ligament with blunt hook forceps, passed around it forward of the rat-tooth forceps; liberation of loop of ligament from the peritoneum by opening forceps, drawing through margins of Gerota's capsule, overlapping and suturing under loop of ligament; closing transversalis fascia, with loop of ligament sewed into upper angle, close to twelfth rib, closing balance of wound. The patients were kept in bed three weeks, and for suture material No. 2 chromicized catgut was used.

An abdominal band, with a thick pad

placed below the navel, was applied at the time of operation, and the patient was instructed to wear this for three months.

Longyear states that Gerota's capsule is easily isolated in the upper angle of the wound, after pushing down the superimposed subperitoneal fat. It is pink in color, thin and tough, and somewhat resembles peritoneum. It should be sought for in the upper angle of the wound, as it will often be missed in the lower angle and the peritoneum incised instead. In uncomplicated cases there is no necessity for opening the peritoneal cavity, as the identification and opening of Gerota's capsule render the nephrocolic ligament easy of access.

The advantages of the operation are the slight mutilation of the parts, the holding of the kidney in a natural, partially movable, manner, allowing of the necessary limited motion which prevents its farther traction on both the duodenum and kidney. A detailed report of the ten cases is given, the first of which was operated on January 8, 1906. The results do not differ greatly from those which follow the usual operation. Nor are the technique and mechanics, as quoted from the author, easily understood.

SPLENECTOMY AND BANTI'S DISEASE.

ARMSTRONG (*British Medical Journal*, Nov. 10, 1906) reports a case of splenectomy performed on a man twenty-six years old, who at the age of eighteen and again at twenty had a slight attack of catarrhal jaundice. A year later, following trauma, he vomited dark material which may have been blood. This was followed by firm enlargement of the spleen, which became steadily progressive. Splenectomy was performed about six years after the accident with a successful result. The author has collected thirty-two cases, including his own, with twenty-three recoveries and nine deaths. The disease seems the most common between the tenth and fortieth years. The average weight of the spleen was four pounds two ounces. When the patients recover they seem to be practically restored to health. Several cases were reported well after upward of six years from operation. It is noted that the frequent bleeding attacks to which these patients are subject cease. In this disease the splenic veins are extremely dilated, together with their contributory branches. Parts of the wall are thickened. In the majority of cases hematemesis has been a frequent and troublesome symptom, sometimes associated with melena. The sequence of events seems to be first enlargement of the spleen, which may precede by years any definite recognizable alteration in the blood. The dilated condition of the vasa brevia commonly observed in Banti's disease, and sometimes associated with esophageal varix, points to an obstruction to the passage of the blood through these vessels, and it is probable that this hematemesis is due to this obstruction, since 40 per cent of the blood in the stomach passes by the vasa brevia to the splenic vein. It is suggested that the primary lesion may be in the veins and that the splenic enlargement is secondary to the long-continued passive hyperemia, and that the poison or poisons causing the subsequent alteration in the blood and changes in the liver are characteristic of the third and last stages of the disease, since the disease is essentially and without exception progressive and tends ultimately to destroy life, excepting as when treated surgically splenectomy is indicated, particularly from the fact that it is followed by an immediate improvement even in advanced cases. The sooner the operation is undertaken the better. Since death from hemorrhage is the major danger the technique should afford perfect access for the control of bleeding. A vertical incision along the outer border of the left rectus, extending from the costal border downward as far as may be required, and joined by one at right angles to the first, and extending well to the left loin, enables the surgeon to deal safely with any adhesions on the outer surface of the spleen, and between it and the diaphragm, as well as the vessels of the pedicle. Special care should be taken to arrest all hemorrhage from the vasa brevia and from the vessels contained in the lienophrenic ligament.

THE TREATMENT OF PROSTATIC ENLARGEMENT.

In a discussion on this subject (*British Medical Journal,* Nov. 10, 1906) THOMAS holds that there is no choice between the suprapubic and perineal routes so far as the mortality is concerned; that either may be followed by disappointing results, such as stricture of the urethra, fistula, and interference with sexual function, and that the prospects of recovery are about 14 per cent in favor of the suprapubic route; that in bad septic cases the operation should be done in two stages—the suprapubic is more suitable for tumors of the middle lobe, for removal of calculi, and the control of hemorrhage when they coexist; that the suprapubic route is unsuitable for surgeons with short fingers or with flexible, thin nails; that post-mortem evidence of cases in which the prostate had been removed shows that anatomically it is not possible to remove the prostate in one mass without also removing the prostatic urethra.

FRACTURE DISLOCATION OF THE SPINE.

WELFORD (*British Medical Journal,* Nov. 10, 1906) reports the case of an engineer thirty-eight years old, who sustained a fracture dislocation at the junction of the tenth and eleventh dorsal vertebræ, for which he received postural treatment in the hospital. Two years later he came under the reporter's care, who noted motor and sensory paralysis of both legs, priapism, incontinence of urine and feces, and cystitis. Laminectomy was performed and showed a prominent piece of bone projecting backward into the canal from the body of the tenth dorsal vertebra. This was snipped off piecemeal, after which the dura was opened, showing a normal cord. A probe which was passed up and down beneath the dura for two inches met with no obstruction. The opening in the dura was closed with catgut and the wound drained for forty-eight hours. A plaster jacket was applied. The patient was immediately relieved from pain and was able to locate finger-touch within one inch, as far down as the pubes and on the inner surface of both thighs. Sixteen days after operation he could move the great toe of his left foot, could use crutches, and throw the left leg far enough ahead to take a step. There was no appreciable improvement in the right leg.

The second case was that of a man sixty years old, who suffered from fracture dislocation of the fourth cervical vertebra. He had complete motor and sensory paralysis of the upper and lower extremities. The pupils were contracted; the face, neck, and chest were of a purple color and bathed in perspiration. Respiration was very shallow and entirely diaphragmatic. Temperature was 104°.

Laminectomy was done forty-eight hours after the injury. There was complete bilateral dislocation forward of the fourth cervical vertebra, and a fragment of detached bone half an inch long lay across the cord. Reduction was easily effected by hooking an aneurism needle up under the posterior arch of the fourth vertebra and making gentle traction, but as it would not remain in the reduced position the transverse processes of the fourth and fifth vertebræ were wired together on both sides. Chloroform was not given. He regained the use of both arms and legs immediately, and talked incessantly, complaining of the pain he had experienced in his neck during the operation. He, however, died at the end of fifty-two hours, showing meningeal and pneumonic symptoms, with a temperature of 108° F.

THE TREND OF THE TIMES IN APPENDICECTOMY.

Under this title SCOTT (*American Journal of Obstetrics,* November, 1906) states that operation approaches the ideal in proportion to its elimination of time, pain, and danger.

Ether and chloroform, he holds, are often followed not only by the expected discomfort but by disastrous results. In his own experience with nitrous oxide and oxygen, now extending over a period of six years, accidents did not occur. So slight are the

after-effects that after minor operations patients within an hour or so can walk home without discomfort. The incision should be just large enough to give access to the field of operation. The extent of the skin incision is of no importance excepting for cosmetic effect; if the patient is fleshy this superficial cut may, of necessity, be a long one. In aseptic cases the fascial separation should be only sufficient to admit the tip of the index-finger; this is crowded through the soft parts, which are easily dilated to admit the entire length of the finger. Ordinarily the anterior border of the liver, lower pole of the kidney, ascending colon, ileum, and, in women, fundus and right tube and ovary can be palpated. The appendix is located, its condition noted, also the presence or absence of adhesions. If movable, the appendix is brought up to the incision by hooking around it the finger, which is then withdrawn; the wound is held open by a pair of retractors, the omentum pushed through the opening, and the appendix removed by any desired method.

Scott notes that though it is probably unnecessary, it has been his habit, as an extra-precautionary measure, to close the peritoneum with one stitch and secure the overlapped fascia with one more. After operation, if the condition justify this, the patient is given more liberty than is ordinarily deemed advisable. Water and other liquids are given earlier and in quantities sufficient to satisfy. The stay in bed is usually from two days to a week. There are patients who experience great relief from a sitting posture within a few hours of the operation. This is especially true of the obese and of persons possessing a sensitive alimentary canal. Some cannot unassisted evacuate either bladder or bowels in a recumbent position. One such took a step or two several times during the evening, although the operation had taken place a little after noon of the same day.

One ideal recovery was back in his office at work four days after operation. One walked up-stairs at the close of the third day, and entertained guests a few hours later.

ABDOMINAL SECTION FOR TRAUMA OF THE UTERUS.

CONGDON (*American Journal of Obstetrics,* November, 1906) reports the case of a multipara, thirty-nine years old, who because of vague abdominal pain and discomfort had her uterus dilated and curetted by her attending physician. He thinking that he felt some growth foreign to the uterine cavity, grasped it, made traction, and twisted. When it gave way and was removed he discovered that he had 40.5 centimeters of small intestine. The patient was immediately brought to the hospital in a condition of shock, with subnormal temperature, and a pulse of 140.

Congdon opened the belly, finding it full of fresh blood. There were two lacerations of the uterus, one through the fundus extending from tube to tube, the second through the uterus and broad ligament on the left side; they were both bleeding freely. A suture checked this hemorrhage completely, and 40.5 centimeters of the ileum was found missing, beginning at the ileocecal valve and extending upward. Hemorrhage from the mesentery had ceased, in spite of the laceration of large vessels. The opening of the ileocecal valve was closed, and ileocolostomy was performed by means of a Murphy button. The patient made an uninterrupted recovery.

As a result of his study of these cases Congdon notes that in 70 cases of rupture in which no operative treatment was undertaken the mortality was 31 from hemorrhage, 18 from sepsis; a total mortality of 70 per cent. As contrasted with this the recoveries from uterine rupture during labor, complicated by intestinal prolapse, whether treated by abdominal section or, in appropriate cases, by simple reposition, amounted to almost exactly 70 per cent.

He states that the accident under discussion—*i.e.,* rupture of the uterus—may occur in medical practice even in the hands of careful and conscientious men, and believes that if this be recognized and no attempt made at concealment after such an accident, if it occurs in the hands of the inexperienced, the mortality need not exceed 50 per

cent, and will probably be less than 10 per cent. Aside from immediate hemorrhage, previous depletion of strength, as in prolonged labor, and occasional implantation of septic germs in the peritoneum, the mortality of promptly and appropriately treated cases should be reduced to the one or two per cent practically inevitable for major operations.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF ACCIDENTAL HEMORRHAGE.

WRIGHT (*American Journal of Obstetrics and Diseases of Women and Children,* November, 1906) holds that the diagnosis in many cases of concealed accidental hemorrhage is generally difficult and sometimes impossible before delivery, since the important symptoms—*i.e.,* anemia and distention of the uterus—are not present in such cases. The immediate symptoms are usually embraced in the term shock from traumatism, and not collapse from loss of blood.

When the hemorrhage is both internal and external the diagnosis is most readily made, but the effect of the blood within the uterus is often difficult to ascertain. Even in such cases the shock from traumatism is often the predominating element, though exceptionally collapse from loss of blood, whether retained within the uterus or flowing externally, may be an important factor. In all cases in which shock is the main condition or the predominating element, the treatment of shock is the one of greatest urgency. In most cases of combined internal and external hemorrhage the introduction of the vaginal plug, with the application of an abdominal binder, appears to be a very safe and effectual plan of treatment.

In a small proportion of cases, especially during labor, puncture of the membrane is beneficial. Any form of forced delivery which includes rapid dilatation of a rigid cervix is unjustifiable. The best operative procedure would appear to be some form of vaginal section, but the field for this is limited and not accurately defined.

ENLARGED PROSTATE—NEW OPERATION.

The modification recommended by CATHELIN (*Annales des Maladies des Organes Génito-urinaires,* No. 17, 1906), but not original with him, consists in the introduction of a finger into the bladder through a small suprapubic opening, to serve as a guide to the operator, who removes the gland *en bloc,* through the perineum.

The patient is placed in the sacrovertical position, the operator stands. A grooved catheter is introduced and the bladder emptied and inflated with air. The skin and bladder wall are then cut through above the pubis. The incision is large enough to admit the finger, and is kept open by an instrument which serves as a guide for the finger. A transverse perineal incision is made in front of the rectum. The left index-finger is introduced suprapubically, not for the purpose of pushing the gland downward, but to serve as a guide in its enucleation against wounding of the vesical mucosa. The right index-finger makes a subfascial enucleation, aided by tenacula forceps and hooked retractor, finally freeing the retropubic lobule till the gland is held only by the urethra; the seminal vesicles and vasa deferentia being visible. The urethra being exposed by the finger is cut across in two places in the prostatic portion and the gland removed in one piece. A gauze drain is placed in the bladder, and after a few days a catheter is introduced and kept in place until the perineum is closed. The suprapubic opening is closed by a gauze pad.

INTESTINAL OBSTRUCTION DUE TO GALL-STONES.

PORTER (*American Journal of Obstetrics.* November, 1906) reports two cases and makes some valuable comments on the question of diagnosis, the main points of which he tells us are as follows:

A previous history of gall-stone disease, often called by the patient "stomach trouble."

Incompleteness of the obstruction.

Relative absence of tenderness, tympany, rigidity, and fever symptoms, especially early in the history of the case.

Persistent and frequent vomiting.

Tumor in the gall-bladder region preceding the symptoms of obstruction, but not present with them.

A migratory tumor, especially if it happens first in the gall-bladder region.

A tumor, even though stationary, of characteristic size, shape, and consistency—*i.e.*, the size of a small egg, oval and hard. However, the best way to make the diagnosis is by opening the belly. Although in many cases of obstruction spontaneous recovery has followed passage of the stones and operation, the mortality remains high. Mayo Robson states that 52 per cent of all cases treated medically die, and that surgery has not shown a much greater percentage of recoveries. Treves places the mortality at even a higher figure.

ARTERIAL VENOUS ANEURISM OF THE NECK.

YOUNG (*Glasgow Medical Journal,* November, 1906) presented at the Glasgow Medico-Chirurgical Society last April two patients wounded in the Boer war, one presenting an aneurismal varix, the other a varicose aneurism. By aneurismal varix is meant a condition in which a large artery communicates more or less directly with a vein, the venous branches and trunk under the influence of the arterial pressure becoming dilated and pulsatile. Varicose aneurism is a lesion in which the opening between the artery and vein is less direct, some sort of sac existing between and around them made up of fibrous tissue or altered clot.

The first case was shot through the upper part of the thorax, but was not operated on. Five years later he was working at his trade, that of an arc lamp trimmer, exhibiting a right pupil somewhat enlarged; no machinery murmur; some evidence of aneurismal enlargement about the junction of the innominate with right subclavian, a slight disproportionate distention of the right superficial jugular vein. This man immediately after his injury, a bullet having passed through his right thorax, showed fulness over an area roughly circular and 2½ inches in diameter, of which the right sternoclavicular joint was the center; faint pulsation palpable over this area, also a strongly-marked thrill; a loud systolic bruit audible in the same region; no pain or dyspnea. A few days later a typical machinery murmur was transmitted along both carotid and subclavian arteries. The cure under conservative treatment was apparently complete.

The second case, also wounded by a Mauser bullet, which passed into the center of the right supraspinous fossa and out between the heads of the right sternomastoid muscle, three-quarters of an inch above the clavicle, at a range of about 300 yards, suffered from hemoptysis and dysphagia for two days. Diminished right radial pulse, enlarged right pupil, pulsating swelling extending 1½ inches upward beneath the right sternomastoid muscle and 2 inches downward from the right intercostal space, and from the middle line of the neck back to the center of the right posterior triangle. The swelling was soft and yielding and with the wide-spread purring thrill palpable for some distance into the distal vessels, especially in the line and course of the right anterior jugular vein; thrill very superficial and easily extinguished by local pressure; felt readily in posterior triangle, but impalpable in the suprasternal notch. Machinery murmur was audible over swelling and over almost the whole of the thorax, also distally as far as the temporal, and the brachial at the bend of the elbow. Five years later found him working with a delivery wagon, but not lifting heavy weights. Was short of breath on exertion and troubled by palpitation. The heart was enlarged; there was a systolic aneurismal bruit, which became more and more apparent as the stethoscope was carried nearer to the base and over the sternum in the direction of the aneurismal swelling. It was heard at its maximum intensity over the clavicle at its inner end, and was con-

veyed well up the neck and as far as the brachial at the bend of the elbow. There was no purring thrill nor evidence of machinery murmur. The radial pulsations were not different in strength and rhythm. Tumor was distinctly obvious, its lower edge seeming to pass behind the clavicle. It was given a bilobed appearance by the sternomastoid muscle passing over it. Pulsation was palpable and visible. A still later report showed further improvement, in that the swelling had diminished and the purring thrill and machinery murmur had disappeared.

The method of treatment for such cases advocated by Silverstone is ligature of artery alone above and below the communication with the vein. This in the case of the vessels of the neck would be an extremely difficult procedure, since exposure of the aneurism has been shown by experience to be attended by very substantial risks. Direct or local ligation must in this region be departed from in favor of simple proximal ligation of the artery. In the first two cases recorded by Makins this was the treatment adopted for arteriovenous aneurism of the carotid, and the results fully justified its adoption, for in the one case all trace of aneurism had disappeared in the patient examined in 1904, and in the other the patient was able to report himself in 1905 as well enough to go out hunting, and to be able to sustain a good fall without ill effects.

THE TREATMENT OF EFFUSIONS INTO THE KNEE-JOINT DUE TO CONTUSIONS OR SPRAIN.

THOORIS (*Archives de Médecine et de Pharmacie Militaires,* No. 11, 1906) on the basis of a very large military experience holds that the two cardinal signs of traumatic effusion into the knee-joint, aside from the swelling, are local increase of temperature over the point of injury and impaired function of the femoral quadriceps. The point of rupture is determined first by palpation, which should be deep, and exercise by the thumb. This will elicit of course tenderness at the point of impact in the case of contusion. A surface thermometer applied to this point and to the corresponding area of the sound knee showed a difference of from a few tenths to 4°, and is proportionate to the degree of injury. This point of tenderness and the high temperature is usually in the inner lateral region of the knee. It is partly because the internal condyle is more exposed to trauma in the case of sprain, because this portion of the bone extends lower than the outer condyle, producing to some degree a genu valgum which may be readily accentuated by violence. The function of the femoral quadriceps is gauged as follows: The patella is grasped firmly between the thumb and index-finger from above and below, the leg lying flat and thoroughly relaxed. The patient is then directed to contract with all his power the quadriceps muscle. If this be perfectly healthy the patella is suddenly and completely snatched from the grip of the thumb and finger. Loss of power is shown by the slowness of contracture and the incompleteness of escape of the patella. This sign precedes the atrophy so common after joint inflammation. It may even precede effusion into the joint. As to the effusion, it is usually of blood and apparently very rapidly absorbed.

Compression and immobilization are considered the worst possible treatment for these cases—the former because the blood is forced out of the patellar cul-de-sac, from which it is most readily absorbed, and because it hastens muscular atrophy, the complication most to be feared. This in turn prevents a perfect joint coaptation and produces a condition which in engineering construction is termed "hammering"—*i.e.,* on each motion there is a jar which implies a slight trauma, and which indefinitely keeps up a condition of inflammation. The same chronic irritation may be kept up by an undue dragging upon the ligaments. Immobilization is held to encourage the formation of a fibrinous deposit, which indefinitely retards absorption. The objection to puncture is that the results are not as satisfactory as those secured by other methods.

As to what the author calls the kinetic

treatment, this is carried out as follows: For forty-eight hours following the accident, this being the period necessary for the effusion to attain its maximum, the knee is slightly flexed over a pillow. Thereafter the leg is elevated by lifting the heel until the thigh makes a right angle with the plane of the bed. This allows the contents of the joint to flow into the suprapatellar pouch, from which reabsorption is rapid. This treatment should be supplemented by passive congestion used according to the Bier method, and by massage, this treatment being applied with the leg lifted by the heel until the sole is turned straight up. On the first day the patient should get up several times without placing his foot upon the ground, but swinging the joint gently. This should be continued until there is no difference in the temperature of the healthy and the injured joint. Thereafter the patient is put upon his feet for very short intervals, this treatment being discontinued if there is any local elevation of temperature. To avoid jars or rolling of the joint perfect coaptation is needful. Hence when the patient first walks his leg should be held stiff in extension. The heel should be put firmly on the ground; thereafter the sole should be brought down so that two sounds occur with each step with an interval of one or two seconds between them. This has for its end the rolling of the articular surfaces upon each other in place of hammering, and the avoidance of limping, which in itself is a source of trauma to the joint.

Finally, the great toe should point directly forward and not out, thus lessening the traumatism to the internal condyle. Steps should be short and equal, the head held up, the shoulders square. This exacts energetic contraction of all the muscles.

The treatment thus outlined is applicable to recent effusions, but not in the least to those which are old, since walking almost immediately brings a hot and tender point at the tibial attachment of the internal lateral ligament. Before prescribing walking the muscular and ligamentous function must be restored by elevation and massage, and it is only when the kneecap is suddenly jerked from the grip of the finger and thumb that the walking is to be advised.

Thooris's tables apparently show an astonishingly rapid convalescence of cases thus treated. He states, moreover, that this is complete and permanent. He terminates his article by the statement that by forbidding the patient to limp the cure will be maintained.

GASTROENTEROSTOMY—POINTS IN TECHNIQUE.

The most frequent source of bad results after this operation is a position of the fistula causing the food to enter that part of the bowel which leads back to the stomach, and DELALOYE (*Deutsche Zeitschrift für Chirurgie,* lxxxiii, 6) proposes certain factors which he thinks lead to the bad results.

The first point is that the loop of the intestine selected must be as close as possible to the stomach, and not the first loop that comes to hand; secondly, it should always be sewed antiperistaltic. The third point is that the opening in the stomach must not be larger than the lumen of the loop of bowel. If these rules are followed there will probably be no trouble.

DISLOCATION OF THE SEMILUNAR BONE.

A very thorough study of these displacements has been made by TAVERNIER (*Paris Thesis,* 1906), who finds no good evidence of dislocation backward.

He divides all cases into three groups: (1) The semilunar is displaced from the scaphoid, cuneiform, and os magnum, but remains in connection with the bones of the forearm. The entire carpus except the semilunar is thus displaced in one piece, and rides on the dorsal surface of the semilunar. (2) The bone shows the same relation to the carpus, but has lost its connection with the radius, the radial surface being turned backward. (3) The semilunar retains its connection with the carpus, and the entire carpus is displaced forward on the forearm. The semilunar always is in

connection with the palmar fragment. The most striking symptoms are those due to compression of the nerves in the palm and the mass formed by the bone on the palm of the hand. Reduction is usually easy in recent cases, and is performed by the surgeon flexing the hand on the wrist and exerting strong traction on it while an assistant presses the bone back into place. If reduction is impossible the extirpation of the bone is indicated, and if any of the other bones of the carpus are fractured the fragment should be removed at the same time. Operative reduction rarely gives good results.

HYSTERICAL CONTRACTURES—TREATMENT BY SPINAL ANESTHESIA.

The muscular contractures which sometimes remain after injury and which have no demonstrable lesion to account for them are relieved, according to LOEHRER (*Münchener medicinische Wochenschrift,* No. 32, 1906), by the injection of anesthetics into the spinal canal.

He mentions two cases, in both of which an injury had been followed by paralysis of the legs, with contractures and pains in the muscles. In the first the anesthesia was used by chance for a slight operation, and when the effect passed off it was found that the contracture had disappeared. In the other case it was used with the idea of curing the paralysis, and was even more strikingly successful. The author thinks the method is worth trying in all cases of traumatic neurosis.

URETHRAL STRICTURE—RADICAL CURE.

The method of choice, according to PHELIP (*Lyon Médicale,* No. 33, 1906), is gradual dilatation, and if this does not cure, or more rapid cure is desired, external urethrotomy should be performed, internal urethrotomy being discarded entirely.

The methods in use for dilatation are permanent dilatation with rubber catheters, temporary with metal sounds, and electrolysis. It is best to use in each case several of these successively or alternately, as the inflammatory reaction is thus lessened. After dilating the stricture, it is necessary to leave as long a time as possible before the next treatment, as too frequent use of sounds causes an inflammatory reaction which increases the original trouble. At least eight days must be left, and if treatment is required before this time another method must be used. The interval becomes greater gradually, and after a few treatments should be increased to several weeks, and then to several months. At this time the catheter may be given to the patient if he is shown how to use it, and not allowed to use it too often. If such methods do not cure, or if immediate cure is required, recourse must be had to external urethrotomy. Internal urethrotomy, even if deep, may lead to recurrence after many years, when there is no sign of return in two or even three years.

SUTURE OF THE ESOPHAGUS—USE OF SLICES OF THYROID GLAND.

The good results obtained by the use of the mobilized thyroid gland in covering wounds in the esophagus led NAVRATIL (*Deutsche Zeitschrift für Chirurgie,* lxxxiii, 6) to try the effect of covering the wound with thin slices of the gland.

The great difficulty in the healing of wounds of this organ arises when a portion is excised, and it was here that the method showed its great value. A piece of the esophagus 3 centimeters long was excised from a dog, after the thyroid gland had been excised and cut into three fine slices, which were sewed together, forming a long band. The band is laid under the esophagus before this is sutured, and is fastened to the muscularis by four silk sutures. The posterior part of the muscularis is then sewed with separate sutures, the mucosa continuously, and the anterior part of the muscularis. Finally the anterior part of the thyroid is put in place. It is not possible to fix the band in place after the ends have been united. Sections of goitres are of no

value for this purpose. In cases in which part of the wound was covered with thyroid and the rest with a strip of muscle laid on circularly the wound healed well, but a stricture resulted. If the wound separates, the thyroid has no influence in preventing mediastinitis, but this may be prevented by sewing both ends of the esophagus into the skin wound. In the cases in which thyroid was alone used there was no stricture.

A CASE OF MESENTERIC THROMBOSIS.

MUNRO SMITH (*Bristol Medico-Chirurgical Journal*, vol. xxiv, No. 93, 1906) reports the case of a healthy man, forty-five years old, who sixteen days before his admission to the hospital was seized with a severe but not crippling pain in his belly. After two hours he went home to bed, but the next day got up to dinner, and after eating stuffed pork suffered violent pains in the upper part of the abdomen and chest, and vomited. Thereafter he vomited daily. His bowels were opened four days before he entered the hospital. When examined by Munro Smith there was no distention; the abdomen was slightly tender on palpation. The pulse was soft and regular. The enema brought away a fairly semisolid motion without sign of blood. Two days later, because of the steady failure of the patient's condition, he was opened. There was found a three-foot coil of ileum, purplish and mottled, with blue and dull-red patches, showing no sharp line of demarcation between the healthy and unhealthy gut. There was no marked distention. He died the day following operation, three weeks from his initial symptom.

The autopsy showed that the mesentery was full of small thrombosed vessels. The superior mesenteric artery was occluded by a thrombus about four inches long extending from three to seven inches from the orifice of the vessel. The upper part of this thrombus was firm, the lower part was softer and more recent. The mesenteric veins were also extensively thrombosed. There was no cardiac lesion nor atheromatous patches in any of the arteries. The author notes that about 170 cases of mesenteric thrombosis have been recorded, the great majority being of the superior mesenteric vessel, not the inferior, the proportion being as great as forty to one, and that the arteries are more frequently blocked than the veins, as five to one. It is noted that there are no symptoms which enable a correct diagnosis to be made during life, and even should this be made by opening the abdomen there is little or nothing to be gained toward the patient's relief.

REFLEX ANURIA CAUSED BY CYSTOSCOPY.

In a case of one-sided tuberculosis, GRUND (*Münchener medicinische Wochenschrift*, No. 37, 1906) saw complete anuria lasting over half an hour follow cystoscopy. After injection of indigo-carmine the urine was colored in ten minutes; the cystoscope was then introduced, and no further secretion occurred for thirty-five minutes, but as soon as the instrument was withdrawn secretion began again. The cystoscope was again introduced, and forty minutes after the first introduction the urine began to flow from the ureter of the better side. No secretion was observed from the diseased side. The left kidney was found by tests to be normal. Excision of the right kidney was advised, but refused. The author warns against accepting the results of such examination, unless reflex anuria can be excluded.

IODINE AS AN ANTISEPTIC.

A 5-per-cent solution of iodine in ether is used by ISAMBERT (*Gazette des Hôpitaux*, 110) in the treatment of open, suppurating surfaces. He fills the abscess cavity or ulcer with this solution, and finds that after the ether has evaporated the wall is covered with a thick layer of pure iodine. One application is ordinarily sufficient. The same treatment is adapted to chronic fistulas. If preferred a 10-per-cent iodine petrolatum may be substituted, or gauze soaked in a 10-per-cent solution in ether and the cavity filled with this.

REVIEWS.

DISEASES OF THE NOSE, THROAT, AND EAR. By Charles Prevost Grayson, A.M., M.D. Second Edition, Revised and Enlarged. Illustrated. Lea Brothers & Company, Philadelphia and New York, 1906.

When the first edition of this book appeared four years ago we cordially recommended it to our readers as being a first-rate practical work upon this important special subject because it presents the various clinical facts as to diagnosis and treatment in such a form as to be useful to the general practitioner. It is now better than ever. Almost every plan of treatment which is recommended is accompanied by a formula showing exactly what the author would apply should the same case be presented for his consideration. There are also a very considerable number of anatomical and pathological cuts designed to illustrate the normal and abnormal states which are met with in the areas of the body which are discussed in its pages, and the colored plates, which have been made by Mrs. Chase, are excellent illustrations of the pathological conditions which the author desires to describe, not only in words but in form. The book does not profess to be an exhaustive work upon the entire field, but is intended as an aid to the specialist and to the general practitioner who by desire, or force of circumstances, is required to deal with cases of this character.

A PRACTICAL TREATISE ON MATERIA MEDICA AND THERAPEUTICS. With Especial Reference to the Clinical Application of Drugs. By John V. Shoemaker, M.D., LL.D. Sixth Edition, Thoroughly Revised. The F. A. Davis Company, Philadelphia, 1906. Price, $5.00.

Dr. Shoemaker's work upon Materia Medica and Therapeutics is so well known that a complete description of it is unnecessary. The opportunity has been taken to make this edition conform to the new United States Pharmacopœia. A number of new therapeutic agents are considered, not only in the way of drugs, but such non-medicinal remedies as the Roentgen rays, Finsen light, Vibro-therapy and Hydrotherapy. Much of the information which formerly existed in Part I of the special edition designed for students, in distinction to that for practitioners, has been introduced in this volume, and we presume that the idea of dividing the book into two parts has now been given up, which we think is wise. When we remember that the chapter on remedial measures other than drugs includes such things as music, light and darkness, and diet, we can gain some conception of the wide scope of the text. Shoemaker's Therapeutics is not only a creditable production from the standpoint of the author, but a valuable member of the group of books in this department of medicine in which America stands preëminent.

PULMONARY TUBERCULOSIS: ITS MODERN AND SPECIAL TREATMENT. By Albert Philip Francine, A.M., M.D. Illustrated. The J. B. Lippincott Co., Philadelphia and London, 1906.

Dr. Francine, who is one of the staff of the Henry Phipps Institute of Philadelphia and the White Haven Sanatorium, has prepared this small octavo volume of 250 pages with the idea of presenting to his fellow practitioners the methods which are employed in these two institutions and elsewhere for the treatment of tuberculosis. It does not profess to be a treatise upon hygiene nor therapeutics, nor indeed does it profess to discuss all the views which are held by many of those who are particularly interested in combating this malady. On the contrary, it is an interesting summary of what Dr. Francine does, or would do, when put in charge of a case of pulmonary tuberculosis, and as he has ample opportunities for carrying out clinical observations upon these cases and has the ability to take advantage of these opportunities, he has compiled for the general practitioner a useful little handbook which can be recommended not only to the doctor

but to the trained nurse as well, particularly if the latter is to be put in charge of cases of this character.

LECTURES TO GENERAL PRACTITIONERS ON DISEASES OF THE STOMACH AND INTESTINES. With Special Relation to Other Diseases. By Boardman Reed, M.D. Illustrated. Second Edition. E. B. Treat & Company, New York, 1907. Price, $5.00.

The first edition of this book was well received in this country and in England. The form of the text is not conducive to conciseness, but the text shows that the author has not only made a thorough study and investigation of the subject, but has also had wide experience in the treatment of the conditions under consideration. One criticism of the book is that it is not equal in its consideration of various topics, which is largely dependent upon the fact that it embodies his views as expressed in lectures rather than in text. It is not the book to be recommended to the medical student, but is emphatically one which will prove of interest to the general and special practitioner.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by H. R. M. Landis, M.D. Volume IV, December, 1906. Lea Brothers & Company, Philadelphia and New York, 1906. Price, $2.00, or $6.00 a year.

The contributors to this last volume of Progressive Medicine for 1906 are Dr. William T. Belfield, who writes the article upon Diseases of the Genito-urinary Tract not including Syphilis; Dr. Joseph C. Bloodgood, who contributes the article upon Fractures, Dislocations, and Surgery of the Extremities; Dr. John Rose Bradford, who writes upon Diseases of the Kidney; and Dr. J. Dutton Steele, who considers the Diseases of the Digestive Tract and Allied Organs. Finally, there is a Therapeutic Referendum by Dr. Landis of about 100 pages, in which the advances in therapeutics during the past twelve months are carefully considered, and practical hints are given in regard to the administration of drugs and remedial measures other than drugs in the treatment of diseases. Dr. Bloodgood's article is one which no active surgeon can afford to do without if he wishes to keep himself thoroughly posted with the literature and practice of his department, and the same thing may be said of Dr. Steele's article upon Diseases of the Stomach, Intestines, and Allied Organs. It is a carefully prepared summary of the subject and embodies a careful description of the author's own views and practices as well as the authors whom he quotes.

ELEMENTS OF MEDICINE. By Alfred H. Carter, M.D., M.Sc. Ninth Edition. H. K. Lewis, London.

The ninth edition of this small octavo volume is much more familiar to our English brethren than to American readers. It does not profess to be a complete and exhaustive description of the diseases which are commonly met with in the practice of medicine at the present time, but rather lies in the scope of its consideration of these topics between a quiz-compend and a fairly complete small manual. The volume closes with a so-called therapeutic index, in which prescriptions are given for a large number of conditions. After going over the book we fail to see how it can meet the needs of either the practitioner or the student. It is not exhaustive enough to be used as a work of reference, and it is too incomplete to be recommended as a text-book to the exclusion of larger volumes. The fact, however, that it has reached a ninth edition and is written by the Professor of Medicine in the University of Birmingham proves that whatever is in its pages consists of good material, the criticism being that it is too brief rather than that it is incorrect.

BACTERIOLOGICAL EXAMINATION OF WATER-SUPPLY. By William G. Savage, B.Sc., M.D. H. K. Lewis, London, 1906.

As the title of this book indicates, it is of far more interest to the public health officer and bacteriologist than to the general practitioner, and embodies the views and experiences which have been gained by its author in carrying out the work described in its pages. As is well said in the preface, many of the data upon which bacteriological ex-

amination of water is based have not passed beyond the regions of controversy, and many investigators employ methods which their colleagues do not approve of. The importance of the subject can, however, be appreciated when we find that the author can fill 278 closely-printed pages without wasting space, and when we find that the finely-printed "recent bibliography" cc rs about 15 pages.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.A., M.D.

One of the most important scientific discussions of the month took place at the Royal Medico-Chirurgical Society when Dr. Hale White opened a discussion on the operative treatment of gastric ulcer. He pointed out that there are several phases of gastric ulcer which might call for operative interference; the most urgent and indisputable is perforation. When this occurs life depends upon promptness in diagnosis and in surgical measures for the closure of the perforation. If there is a doubt as to diagnosis it is certainly right to explore, for in almost all the conditions which simulate perforation of a gastric ulcer laparotomy is necessary. There are, however, two diseases which sometimes simulate this accident closely, namely, hemorrhagic pancreatitis and hysteria, in which laparotomy is undesirable treatment. Some authorities hold that severe hemorrhage is an indication for operation in some cases of gastric ulcer; Dr. Hale White, however, has found medical treatment almost always effectual in cases in which the bleeding is from a general oozing from the stomach wall, whilst where it is due to ulceration into a vessel death often results directly from operation, and even if the patient survives the operation the hemorrhage is sometimes quite uncontrolled. There are cases in which hemorrhage without killing the patient renders her a chronic invalid by its frequent recurrence, and in such cases if medical treatment fails it might be advisable to make an anastomosis between the stomach and the small intestine. In other cases, owing to adhesions between the ulcerated stomach and adjoining coils of intestine, the patient suffers from recurring abdominal pains, which might be severe and sufficient to cause much interference with health and comfort. Operation might give permanent relief in such cases. Another condition in which surgical treatment is usually more effectual than medical is the extreme dilatation of the stomach whic sometimes results from an ulcer near the pylorus.

Dr. Hale White concluded with a warning that in none of these conditions is or eration free from risk; moreover, operatio sometimes entirely fails to relieve the symptoms, and if gastrojejunostomy is performed there is sometimes regurgitation of food from the bowel.

Mr. Mayo Robson described his own experience of operative procedures in such cases, and showed that the mortality is little over 3 per cent, whilst the mortality from medical treatment is about 33 per cent. I shall not quote his remarks here, for they have been published in full elsewhere; suffice it to say that he made out an excellent case not only for the operative treatment of perforation and hemorrhage, but also for the tetany which results from the dilatation of the stomach consequent on gastric ulcer, and for the hour-glass constriction which is also usually a result of gastric ulcer. Sir Dyce Duckworth was of Dr. Hale White's opinion that operative treatment is very rarely advisable for gastric hemorrhage; he said it is very rarely fatal, and although operation has occasionally been successful, it has also failed completely. He was in favor of prolonging the medical treatment of gastric ulcer for

many weeks, or if possible for months. Rectal feeding is particularly useful, and he doubted if it is a "starvation diet," as it has been called.

Gonorrhea was the subject of discussion one day this month at the Hunterian Society. The arthritis especially was considered; this occurs at any stage of the disease, but especially in the late stage, and equally in either sex. The so-called puerperal synovitis is often gonorrheal, and it seems likely that cases of "rheumatoid arthritis" are sometimes gonorrheal in origin. On the other hand, as one speaker mentioned, the patient with an arthritic diathesis is specially liable to gonorrheal arthritis. It is clear that the diagnosis may not be easy, for the finger joints may be affected, and sometimes even the metatarsophalangeal joints alone; the presence of extensive edema is a characteristic of the gonorrheal infection, but sometimes the resemblance to tuberculous arthritis is very close. As to the treatment, various opinions were expressed; one was in favor of intermittent constriction of the limb; another had found fixation in splints useful during the acute stage. Dr. MacMann recommended aspiration of the joint where there is effusion, and incision if any pus is found. Injection of antistreptococcic serum is found useful in some cases.

At a meeting of the National Health Society Sir Frederick Treves has recently been holding forth upon the food supply of this country. He said that whilst on the whole it is good, there is no guarantee often of its purity: the public, he said, do not seem to mind anything they cannot actually see, and as the bacillus of typhoid is not as large as a tadpole they seem to have no objection to swallowing it. The treatment of our meat is in no way better than in the days of the cave-dweller. The cave-dweller indeed had the advantage of us: he saw the meat killed, we do not; but he carried the joint on his bare head, so do we; he deposited it on a dirty floor, so do we; he kept it exposed to any dust which might be flying about, so do we. After all, we are no whit in advance of neolithic man. Sir James Crichton-Browne followed in the same strain, and evidently fresh from a perusal of "The Jungle." He said that canned and preserved foods are excellent in their way, but not on the whole so nutritious as fresh meat; in some instances the process used to protect them from decay protected them also from digestion. As, however, tinned meat is a necessity it is only right that it should be properly inspected and tested. He would abolish all private slaughter-houses.

The new buildings of University College Hospital, which owe their existence to the munificence of Sir Blundell Maple, were formally opened this month by the Duke and Duchess of Connaught. The new building cost two hundred thousand pounds, and since its erection Sir Donald Currie has completed the scheme by a gift of a hundred thousand pounds for the erection of a school of advanced medical studies, a home for nurses, and a home for students attending midwifery, whilst his daughters gave another large sum of money to furnish the new nurses' home. There was a distinguished gathering to meet their royal highnesses, and after the usual speechifying the hospital was solemnly declared open, having been in active use for many months past, and open to all comers. But still the solemn declaration must be made, so the duke made it, gracefully enough, and the trumpets played a great flourish and the architect presented his royal highness with a golden key, and it is to be hoped that the hospital will live happily ever after.

Sir James Crichton-Browne made a statement recently that butter in this country could hardly ever claim even a courtesy-title of "genuine;" it was more properly described as "clarified grease." Certainly it is "doctored" in the most shameless manner with pigments, foreign fats, and preservatives. Some years ago a Government Commission was appointed to consider the question of preservatives in food, but the evidence was somewhat conflicting and the outcome not very useful; so there is to be a conference held at the Institute of Hy-

giene shortly under the presidency of Professor Tunnicliffe to discuss preservatives in food, their use and abuse.

Great indignation is being expressed by the antivivisectionists at the persistence of the Royal Commission in holding its sittings privately. No doubt they hoped for some "revelations" which they might convert into harrowing "copy" for the baser sort of half-penny newspapers; but if the present government has shown itself lamentably feeble in most things, it deserves thanks for withstanding the clamor of mischief-making faddists in this matter.

A satisfactory and somewhat novel decision has just been given in a law court against a vender of a quack medicine, who was prosecuted by the Crown for obtaining by false pretenses money for worthless powders which were advertised as being a cure for all manner of diseases. The powders were found to consist of sodium bicarbonate and potassium bromide, and the advertisements stated that this wonderful medicine had been discovered by two clergymen in some part of Africa. The powder had been sold for many years, no doubt bringing in a handsome revenue to the proprietor, who advertised it also in the name of clergymen who were supposed to have derived benefit therefrom. This benefactor of the public is sentenced to three months' hard labor in prison, and the judge in passing sentence wished success to the Crown in undertaking prosecutions of this kind.

Amongst the recent birthday honors conferred by his majesty the king every one was pleased to hear of knighthood for Mr. Tweedy, the ophthalmic surgeon who held the office of president of the Royal College of Surgeons for two years. Sir Victor Horsley has just resigned his professorship of clinical surgery and his post of surgeon at University College Hospital, on account of pressure of many other duties.

Two distinguished London physicians have passed away this month—Dr. Schorstein, who was on the staff of the London Hospital, and Dr. Symes Thompson, who was consulting physician to the Brompton Hospital for Consumption. The death of Mr. George Herring also has removed a munificent supporter of our London hospitals.

"PRINCIPIA THERAPEUTICA."

To the Editor of the THERAPEUTIC GAZETTE.

SIR: It would be very unreasonable in a writer to take exception to a review of his writings because of an adverse opinion expressed. He must take the favorable and the unfavorable, and prepare himself to accept the latter with fortitude.

It is otherwise, however, in the case of a clear misstatement, for he is bound to protect himself against a false impression. It is for this reason I write, in the assurance that you will help me to do myself justice. The review of my book Principia Therapeutica in the November 15, 1906, number of your journal is very brief. Detailed criticism is, of course, impossible within so limited a space; nor is this attempted, for indeed the only criticism is upon the chapter headed "Imponderabilia." In this your reviewer says "there is a brief discussion of the forces of light, heat, and electricity, which however is so brief and inadequate and so superficial that it is of no practical value in medicine, however interesting it may be as representing Dr. Sainsbury's views."

Now if this criticism means anything it is that the Imponderabilia are the forces light, heat, and electricity, and that the chapter in question discusses these primarily and essentially; whereas the forces above mentioned are only brought in incidentally, as it were, in order to exclude them *as not deserving their old name of imponderable*. The Imponderabilia which I discuss are something quite different, and to them the chapter is devoted essentially. Whether they are discussed superficially or exhaustively it is not for me to say, but that I have attempted any discussion, even superficial, of the forces of light, heat, and electricity "under the heading Imponderabilia" is a misrepresentation of fact which I trust you will help me to remove by publishing this letter.

I am, yours faithfully,

HARRINGTON SAINSBURY.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., FEBRUARY 15, 1907. | Third Series, Vol. XXIII, No. 2.

ORIGINAL COMMUNICATIONS.

THE MEDICAL MANAGEMENT OF PREGNANCY.

BY EDWARD P. DAVIS, M.D.,

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By the medical management of pregnancy we understand the care of the pregnant woman in all particulars, except such as may demand operation.

First in importance is the diagnosis of early pregnancy; it cannot be too clearly remembered that this is impossible from symptoms only; a vaginal examination is necessary for a positive diagnosis. The most important point which this examination will disclose will be the condition of the uterus; the enlargement of the womb, its shape, consistence, presence or absence of contractions are the important points to be recognized in examination. The enlargement of the uterus in pregnancy is often not symmetrical before the third or fourth month; that half of the womb in which the ovum lodges may be considerably more enlarged than the other; there will, however, be present some sign of the development of the lower uterine segment, and this is peculiar to pregnancy and is not counterfeited by other conditions.

To ascertain this the fingers are pressed gently but firmly into the uterus just above the cervix; this may be done either through the vagina on the anterior wall of the womb, or in the rectum on its posterior surface. If the lower uterine segment is forming the uterine tissue will yield at this point, and the body of the uterus will be felt bulging outward above the fingers. During the examination uterine contractions may be felt, and should this occur it would strengthen the diagnosis of pregnancy.

The other signs of less value are the softness of the cervix, the pulsating of the vessels, the darkened color of the tissues, and increased secretion; all of these may be present, however, without pregnancy.

While this examination is being made the position of the uterus should be determined; if it be sharply anteflexed and ill-developed the physician may expect nausea, more or less pronounced, as a complication of pregnancy; if the uterus be retroflexed and retroverted, attention must be given lest it becomes incarcerated and abortion or infection should develop. This examination should also disclose any marked abnormality in the patient's pelvis; pelvimetry will give more detailed information, but palpation is of especial value. Another advantage of vaginal examination in early pregnancy is the recognition of pelvic tumor or other abnormal condition of the pelvic organs.

Anterior displacement of the pregnant womb should be treated by causing the patient to abstain entirely from pressure by clothing upon the abdomen; while this is very difficult to accomplish it is of undoubted importance. Such pressure increases nausea and very much disturbs the general condition of the patient. Backward displacements of the womb require correction and the prolonged use of the knee-chest posture. To replace the womb the patient's bladder should first be thoroughly emptied, and she should then be put in the knee-chest posture; introducing one or two fingers into the vagina, the fundus should be pressed

upward, forward, and to the patient's right side; pressure should be intermittent, gentle, but persistent, and usually the physician will feel the fundus move slowly upward until it passes beyond his reach; the cervix should then be carried well backward, completing the replacement. If there is danger of its return, a retroversion rubber pessary should be fitted, having a soft posterior bar. If there is thickening or contraction of the tissues, wool tampons should be employed instead, and form an especially valuable method of treatment. These should be made in size appropriate for the patient's development, and should be sterilized by boiling in one-per-cent lysol. They should be introduced with the patient in the knee-chest posture, the posterior vaginal wall being thoroughly drawn upward by a Sims speculum; the tampon should be so placed as to raise the uterus and carry the cervix backward. Such a tampon may be safely retained for twenty-four to thirty-six hours, the patient taking a very gentle irrigation of one-per-cent lysol after removing the tampon. Three times weekly the tampon should be replaced. Cases of backward displacement in which the patient has no tampon or pessary should take the knee-chest posture, night and morning for ten or fifteen minutes, until the fourth or fifth month. In cases which do not yield to this treatment the womb must be replaced under ether and retained in position as already indicated.

When the physician is assured that the patient is pregnant and that the position of the womb is favorable for its normal development, attention should be directed to the patient's general hygiene. Here verbal directions are not to be trusted. A diet list, directions for bathing, exercise, avoidance of constipation, adjustment of clothing, hours of sleep and rest, and a description of those symptoms which should be reported, should be given to the patient by her physician.

In choosing the diet the patient's natural tendencies must be closely studied; while milk, fruit, and bread form an ideal diet for the pregnant woman, very few will accept it. We find it almost invariably necessary to cut down the amount of meat taken by a patient, substituting milk for it as far as possible, and frequently to cut off many indigestible dishes. Meat once daily is quite sufficient during pregnancy, while healthy women may take eggs or fish once daily. In using milk it may take the place of meat at luncheon, or if the patient cannot take much food it may be used especially during early pregnancy, about the middle of the forenoon, in the afternoon, and before retiring. It may be diluted with Apollinaris, Vichy, plain soda, mixed with lime-water, made into junket, buttermilk, cottage cheese, or taken with a little salt in each glass; usually a few biscuits should be taken with it.

All ripe fruits and vegetables in season are indicated; the most easily digested meats only should be chosen, and fish only attempted when absolutely fresh and sound. We are accustomed to exclude, if possible, from the diet of pregnant patients, heavy cheeses, nuts, pickles, pastry, candies, pork, veal, fried dishes, rich sauces and gravies, highly spiced foods, alcoholic beverages, and large quantities of strong tea and coffee.

Stimulants are not only not necessary in pregnancy, but almost invariably are distinctly harmful; if the patient is accustomed to tea and coffee, they should be taken in moderation only, freshly made and not strong. If the patient habitually uses wine or beer, these may be used in small quantity only; the heavy alcoholic beverages should be forbidden.

The use of water as a beverage is most important during pregnancy. Few patients who suffer with nausea in the early months are not benefited by the use of Vichy, Apollinaris, soda, or any other slightly aerated and pure water. Much water cannot be taken with meals, but in moderate quantities it should be used throughout the day and evening. In cases in which the kidneys are overburdened and the heart muscle is not strong, water should not be given in large quantities; with these patients it is safer to restrict the diet to milk, with other treatment appropriate to the condition. While we may restrict the diet of pregnant patients, a mistake must not be

made and insufficiently nourish them. They require abundant nourishing food, and ordinarily digest and assimilate it well.

The patient's bowels must be made to move sufficiently, daily, by a suitable preparation of cascara or compound licorice powder; enemas and salines for habitual use should be avoided. A selected diet and the proper use of water will do much to avoid constipation. The condition of the skin must be kept good by frequent baths and bathing; baths should be neither hot nor cold, and may be used in accordance with the patient's health. The shower bath should be avoided, but the sponge and tub bath should be used very freely. In summer surf bathing is dangerous because of the shock of the waves, but bathing in still sea water or fresh water from a beach, with gentle swimming, may be permitted. Exercise in walking or driving is of great importance; in suitable weather the patient should walk daily in the open air to the point of reasonable fatigue. Clothing should be suspended from the shoulders by suitable waists, side garters should be substituted for circular garters, clothing should be made thoroughly comfortable in accordance with the patient's habits, and chilling the surface of the body should be carefully avoided. Abundant sleep in well-ventilated rooms and rest as the patient's sensations indicate are also necessary. It must not be inferred that a patient because pregnant is to live an indolent and useless life; on the contrary regular activity of mind and body is most essential for the safety of the mother and the development of her unborn child. Those mental conditions which stimulate and animate and cheer are greatly needed. Those things which are beautiful and delightful cannot be brought too closely to the patient's attention.

The patient should be asked to avoid long and tedious journeys, the use of a motor car, driving over rough roads, sailing in rough water, lifting, straining, reaching high above the head, running a sewing-machine, and going up and down long flights of steep stairs. A word of especial caution is necessary regarding motoring: until motor cars run slowly and smoothly, without frequent accidents, they are dangerous for pregnant women; their use has brought about miscarriage, and is often exceedingly fatiguing to the patient.

The patient should be instructed to report to her physician all signs and symptoms of returning menstruation or vaginal hemorrhage, pain in the abdomen or back, obstinate nausea, disturbances of vision, headache, constipation, and swelling of the extremities or face.

After the tenth week of pregnancy the patient's nutrition will require especial attention to avoid toxemia. In estimating the patient's condition the examination of the urine is of secondary importance; of primary importance is the condition of the patient's nervous system as shown by the presence or absence of headache, increased pulse tension, abnormalities of the cerebral condition, and marked disturbances in the action of the secretory nerves. These symptoms can be appreciated only by personal examination of the patient; hence the physician must see his patient not infrequently during her pregnancy. The condition of the patient's digestion and assimilation may best be ascertained by the study of the tongue, number and character of the bowel movements, the condition of the appetite, and also the study of the urine; in the last we observe especially the specific gravity, the amount of nitrogenous waste which it contains, as indicated by urea or otherwise and by the microscope, the presence or absence of débris from the kidneys. It is almost impossible with private patients to obtain an accurate account of the amount of urine passed in twenty-four hours; this may also vary greatly while the patient remains in good health. In our observation fifty-nine ounces was the average of patients whose condition was under complete observation, on a general and not restricted diet.

The avoidance of toxemia is best accomplished by careful hygiene on the lines indicated: restriction of diet, proper use of water, and laxative or purgative medicines. In many cases patients require increased rest, while others must take additional exercise. Calomel taken in small doses for

ten days or two weeks is the most valuable drug in our acquaintance to increase the solid waste of the body. Frequent use of baths is also of great importance. In studying the metabolism of pregnant patients it must be remembered that their percentage of solid waste is frequently lowest about the seventh or eighth month, and that after that in healthy women it rises steadily until the completion of pregnancy. Just before labor the amount of solid waste in the urine is frequently higher than during any other period of gestation.

The growth of the fetus should engage the attention of the physician as pregnancy goes on. An effort should be made to recognize the completion of six months' gestation, if possible. The position of the uterus is fairly constant at the umbilicus at this time, and this affords a computation for the duration of pregnancy. The size of the fetus should again be estimated at the seventh, eighth, and ninth months, and unless descent and engagement occur the patient should be again examined from the ninth month to the termination of pregnancy.

The estimation of the time of confinement and the period of gestation is exceedingly difficult. The patient's history will help somewhat, if we ascertain whether menstruation ceased absolutely or whether there was a partial return of this function after a normal period; where menstruation ceases absolutely pregnancy probably occurred soon after the termination of the last menstrual period; where a normal period was succeeded by a partial menstruation, conception probably occurred just before the incomplete or altered period. By recognizing the sixth month, when the fundus is at the umbilicus, and the development of the fetus at successive months, the physician may trace its growth to the time when viability is assured and the child begins to show signs of adjusting itself to the mother's pelvis.

In attempting to estimate the duration of pregnancy, the physician must not forget that in some cases pregnancy is prolonged considerably beyond 280 days; this is not necessarily injurious to mother or child, provided the child is proportionate to the mother's pelvis. In primiparæ, the patient should be examined at the time when the fetus begins to descend in the upper pelvis. If this descent occurs and continues the pelvis evidently is of sufficient size to accommodate the child, and prolongation of pregnancy brings with it no especial danger. On several occasions we have seen pregnancies of 290 to 300 days terminate favorably to mother and child.

Between the seventh and eighth month a complete examination of the patient should be made to determine the pelvic size and position and presentation of the child, and if possible the position of the placenta, and thus to form some prognosis regarding labor. While external pelvimetry cannot exclusively be relied upon it gives information of great value and should not be neglected. Especial attention should be given to the oblique diameters of the pelvic brim, as in one of them the presenting part usually descends. By palpation and auscultation the position and presentation can usually be made out. Patient auscultation of the abdomen will reveal heart sounds and often the sounds characteristic of the location of the placenta. In some cases coils of the cord and partial occlusion can also be recognized by palpation. Should external pelvimetry give warning of pelvic abnormality, a thorough internal examination of the pelvis should be made and its true conjugate carefully measured. If abnormalities of moment are discovered it is well to inform the husband or other responsible relatives of the patient, and while not discouraging them, to say to them that it may be necessary to take unusual precautions at the time of labor. We have seen nothing but good results follow such a course, and believe it to be fairest to all concerned. This examination should also include the scrutiny of the breasts; the patient should be instructed to draw out the nipples, and an ointment containing boracic acid should be given for daily use. The epithelia of the nipples should be brought into the best possible condition for lactation.

The preparation of the patient for labor should consist in giving her a written

memorandum for antiseptics, dressings, and needed drugs; that which we are in the habit of using is as follows: Fifty tablets bichloride of mercury (1 to the pint equals 1 to 1000); lysol, 6 ounces; bichloride gauze, 5 yards in glass jar; borated cotton, 1 large box; sterile saturated solution boracic acid, 1 pint; 1 large, new fountain syringe; double rubber sheeting, 2 yards; 1 medium-sized soft catheter; 1 glass catheter; 2 stiff nail-brushes with wooden backs; 1 new medicine dropper; Squibb's fluid extract of ergot, 1 ounce; Squibb's ether for anesthesia, 2 half-pounds; brandy, 2 ounces; tincture green soap, 8 ounces; 1 box containing tubes aseptic ergot, Parke, Davis & Co.'s; 20 tablets each containing sulphate of strychnia, 1/40 grain.

We also give to the nurse the following memorandum, asking her to be responsible for those articles: Three good-sized basins; 3 good-sized pitchers; 6 sterile sheets; 2 dozen sterile towels; 1 dozen breast binders; 1 dozen abdominal binders; large package of dressings for external use; sterile cotton sponges.

It is well to give the nurse a simple sedative which can be employed if the pains are nagging during the first stage of labor and at night; bromides of sodium and ammonium answer this purpose well. The patient should be prepared for labor by a copious high enema, by thorough antiseptic preparation of the external genital organs, trimming away the hair closely; if the patient does not urinate satisfactorily, the catheter should be passed. In accordance with her strength she should be up and about during the first stage of labor, if it occurs during the day. The physician from his examination previously will know to which side of the pelvis the presenting part is directed; he should instruct the nurse to have the patient lie upon that side during active labor; thus in the first position the patient will lie upon her left side, her lower extremities flexed. In the second position she will lie upon her right side. The nurse should see to it that an abundance of clean, sterile linen, hot sterile water, and a suitable bed and tables are ready. The physician should instruct the nurse definitely when he wishes to be summoned. Circumstances may differ with various cases, and the physician may wish to see one patient so soon as she comes into labor, while another may safely go considerably longer. If a physician does much obstetric work, it is convenient to have several bags fitted with the necessary instruments and appliances for labor, including a sterile gown, gloves, and suit. In dealing with out-of-town patients such a bag may be sent by express several days in advance of labor, and thus save the physician the inconvenience of transporting it in a hurry.

THE HYGIENE AND MANAGEMENT OF PREGNANCY.

BY GEORGE M. BOYD, M.D.,
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While pregnancy is essentially a physiological condition, woman to-day, the product of civilization, is so far removed from her progenitor that to permit her to advance in pregnancy and labor without the intelligent guidance of a physician is to invite complications, sometimes far-reaching, and even ending in the death of both mother and infant. The midwife, the failure to appreciate the necessity of surgical cleanliness, and last, but not least, the superficial study of obstetric cases, are the factors that in the past have retarded the progress of midwifery. The last two decades have been epoch-making. Clean surgery and a closer study of the obstetric problem have reduced very materially the fetal and maternal mortality. The past century closed with our science placed upon a higher level than ever before in its history. At the present day obstetrics conserves the child's interest more than it ever did in the past. It makes us all-mindful of the fact that we have two lives at stake, and that we must not sacrifice the one to save the other.

In the twentieth century there is still much to accomplish. Let us hope that with the advance of civilization the midwife may

soon be replaced by the physician; or else that the evil may be in part remedied by compelling her to attend a full course in obstetric nursing: for no other than the physician has the right to assume the responsibility of an obstetric case. When one recalls the many changes that take place in the woman during pregnancy, and how ill-defined and how difficult to detect are the complications arising during this period, one is all the more impressed with the necessity of placing her under close observation. Unfortunate is the physician who is forced to practice obstetrics in a community in which, through the ignorance of the people and the carelessness of his predecessor, the course of pregnancy is neglected and his services are requested only at the onset of labor. Our results will not be what we should wish until there exists a better appreciation of the obstetrician; or I might reverse this and say, until we do better obstetrics. It remains for the recent graduate to carry on this work of education.

A woman should consult her physician as soon as pregnancy is suspected. Among the wealthier classes of the community this is customary, but women in the lower walks of life do not, as a rule, consult their physicians until the latter months of gestation. As the result of this delay many patients present themselves in an unhealthy condition. As it is essential for the woman to be in the very best condition to undergo the ordeal of labor, it is incumbent upon the obstetrician to inform his patient as to how she must live and as to any abnormal symptoms that may arise. To better carry this knowledge into action the patient should be given a printed card outlining the life she should lead.

The hygiene and management of pregnancy may be discussed briefly under the following headings: diet, the bowels, clothing, exercise, bathing, care of the breasts, observation of the urine, and preliminary examination.

Diet.—The diet during pregnancy should be highly nutritious and easily digested. It should contain an abundant supply of proteids and fats, and should consist of fresh meats, vegetables, fruits, and water. It must be remembered that it should be taken with a twofold purpose, the health of one being and the growth of another. Normally the appetite is increased after the cessation of the morning sickness. Three meals should be partaken of daily. Breakfast and the noonday meal are more important than that taken in the evening; at these two meals the appetite should be completely satisfied, while at supper the woman should eat sparingly. It is better that the chief meal should be taken early in the day than at the late dinner hour.

In patients who have previously given birth to very large children a restricted diet is advisable during the last two or three months. It has been pointed out by many that a diet poor in hydrocarbons and fats exerts a marked influence upon the weight of the infant. By so modifying and reducing the child's weight difficult labor or the induction of premature labor may be obviated.

Meigs has been very successful in the palliative treatment of the nausea and morning sickness of pregnancy. He has his patients take a light breakfast early in the morning, an hour or two before rising, a cup of coffee with a piece of toast being brought to the bedside at the earliest morning hour. After taking this breakfast the patient would again fall asleep.

The Underfed.—In women belonging to this class a condition exists that is sometimes due to ill health and sometimes to overwork. For such a woman a special diet is necessary. She must follow out such a course of feeding as will relieve the existing infirmity and also improve her physical condition, the improvement being noted chiefly in increase of weight. The ordinary diet should be supplemented by taking as much milk at a meal as can be readily digested. In some cases milk must be used exclusively, and its ingestion is best accomplished by taking a fixed amount at stated intervals, with the addition of lime-water or salt to make it more acceptable to the stomach. Wines and malt liquors, while not as a rule needed in healthy women, are of very great value to those in this class

who suffer from loss of appetite and feeble digestion.

The Overfed.—The majority of women during pregnancy belong to this class. They eat heartily at each meal, and sometimes between meals. They lead a sedentary life, and the result is that as gestation advances they become a burden to themselves. Eating too much causes digestive disturbances, and excessive weight has a decided effect in increasing the growth of the child. Convulsions may follow the overloading of the stomach with indigestible food. A case is reported in which a young expectant, in the eighth month, ate heartily of fruit-cake and preserved quinces. Two hours later she was taken with convulsions. An emetic was the remedy that in this case successfully relieved the trouble.

The Bowels.—It is very important to obviate any tendency to a sluggish condition of the bowels, as constipation, together with lack of exercise and inordinate eating, predisposes to the toxemia of pregnancy. Constipation is frequently a troublesome symptom in the latter months, owing to the pressure of the uterus on the intestines interfering with the normal peristaltic movements. When it exists care should be taken that the bowels move daily. This is best accomplished by the use of vegetable laxatives, such as cascara sagrada; or pills of aloin, belladonna, and strychnine may be used. The saline cathartics are not often indicated.

The Clothing.—The clothing should be sufficient to protect persons from cold. The corsets should be especially adapted to pregnancy, so as not to compress the nipples or breasts, or interfere with the growing uterus. The garters should not be worn so tight as to compress the vessels of the lower extremities. The clothing should be suspended, as far as possible, from the shoulders. When the abdomen is much relaxed from previous pregnancies, the multiparous patient will often derive a great deal of comfort from the use of an abdominal bandage. In the latter months of gestation, when there is swelling of the legs or a varicose condition of the veins, the legs should be bandaged or an elastic stocking should be worn.

Exercise.—The pregnant woman should live in the open air as much as possible, and should take exercise systematically. It is difficult to specify the exact amount of exercise that should be indulged in, but a safe rule to follow is to instruct the patient to desist as soon as she begins to feel fatigued. Violent exercise, such as dancing, horseback-riding, driving over rough roads, lifting heavy weights, and the like, should be forbidden. In the latter months of pregnancy long journeys should not be undertaken unless absolutely necessary; and travel by water must be absolutely prohibited, owing to the danger arising from seasickness.

Bathing.—Too much stress cannot be laid upon the importance of keeping all the emunctory organs in healthy condition, especially the skin, on account of its eliminating and respiratory function. The most efficient mode to secure this end is the habit of frequent bathing—that is to say, daily or two or three times a week, according to the custom of the individual. The water should be neither hot nor cold, as bathing in very hot or very cold water is dangerous. Sea-bathing should be indulged in only with moderation.

Care of the Breasts.—The mammary gland should not be compressed. The nipples require more particular attention; they should be washed daily with warm water, and in the last two months of gestation it is wise to bathe them daily with tincture of benzoin, tincture of arnica, or alcohol and water. By carrying out this treatment the nipple is rendered less sensitive, and therefore less liable to abrasion; and later, in nursing, the occurrence of fissures, with the danger of mammary infection, may be prevented. When the nipples are small and imperfectly developed a gentle traction daily is sometimes of marked benefit in lengthening them; but more than gentle traction may provoke uterine contraction. Little can be done to relieve the inverted nipple.

Observation of the Urine.—The urine should be examined carefully at regular intervals during pregnancy. The danger of

renal disturbance should be explained to the patient, and a positive assurance should be given her that this danger can be averted, if frequent and regular examinations of the urine are made. Chemical and microscopic examinations should be made at least once a month during the earlier months, and not less than once weekly during the last three months of pregnancy. Close observation and regulation of the function of the kidneys during gestation are of great importance, especially when the toxemia of pregnancy is suspected. The presence of albumin, even if in slight quantity, should always be looked upon with suspicion. In addition to the test for albumin, the quantity of urine voided in twenty-four hours and the quantity of urinary solids, especially urea, should be estimated. The patient should be impressed with the importance of reporting to the physician the following symptoms, should they arise: a scanty flow of urine, persistent headache, persistent constipation, and swelling of the feet.

Preliminary Examination.—Not later than the two hundred and fiftieth day of gestation a careful examination should be made of the pregnant patient: first, for the purpose of verifying the diagnosis of pregnancy; and next, to determine the size and shape of the pelvis, and the presentation and position of the fetus.

The examination can usually be made more conveniently at the home of the patient than at the office of the physician. She should be placed upon a hard mattress in the horizontal decubitus. It is not necessary to expose the abdomen. The skin should be covered with only one thickness of newly laundered linen. At this examination the general condition should be carefully noted; and particular attention should be given to the measurements of the pelvis, as well as to the position of the fetus.

After having verified the diagnosis of pregnancy, it is well to make at least three external measurements of the pelvis, showing the distance between the iliac spines and between the iliac crests, together with the external conjugate measurement. If these measurements are found to be nearly normal, no internal measurements are necessary; and this statement applies with particular force to the multipara. If, however, the pelvis seems small and the external conjugate measurement is much below the normal, say 18 centimeters, an internal examination should be made. If the external conjugate measures less than 16 centimeters (6½ inches), shortening of the true conjugate is certain, and is likely to be considerable; if from 16 to 18 centimeters, shortening is extremely probable; from 18 to 20, the chances are even; from 20 to 21, shortening is possible; and above 21, contraction in this direction may safely be excluded.

After measuring the pelvis, one should carefully examine the abdomen. The presentation and the position of the child should be determined by external palpation, and the existence of any abnormality noted. If the head is not engaged and is movable above the brim of the pelvis, an internal examination should always be made.

Failure to make this examination often leads to serious consequences. The importance of studying pregnancy-patients before labor, and not taking it for granted that those whose previous labors have been normal will have no difficulty in subsequent ones, was impressed upon me by a case that I saw in consultation some years ago. The woman's physician had delivered her three times without difficulty; but the fourth labor, which he expected to be as easy as the others, was complicated with a disease of intra-uterine life, hydrocephalus. The diagnosis of this was not made until the patient had become greatly exhausted, and the result was fatal.

Another case of interest in this connection was that of a woman who presented herself at the clinic of the Philadelphia Lying-in Charity. On examination it was found that she was pregnant for the third time, and that the fetal ovoid was in an oblique position, the head being in the left iliac fossa. Interference being necessary, she was sent to the ward and put to bed, and immediate attempts were made to turn the ovoid by external version. This alteration was easily made, and a lateral support with

compresses was adjusted so as to hold the head at the pelvic brim until the onset of labor, which fortunately soon began.

If one makes a careful examination of the patient and practices obstetric palpation, an internal examination will seldom be necessary before the onset of labor. It will usually be possible to make a diagnosis of the presentation of the ovoid, and with the recognition of a malposition to correct the trouble before labor commences. When abnormal conditions are recognized at the preliminary examination, it is incumbent upon the obstetrician to inform some responsible member of the family of their existence.

Should a patient absolutely refuse to submit to this examination, the physician had better refuse to attend the case; but the writer has never encountered serious objections to it on the part of the patient. By exercising a little tact one can, in the majority of cases, overcome any such objections. One should carefully explain the importance of the knowledge that will be gained through the examination, and the fact that in all likelihood it will enable one to prognosticate a comparatively easy and safe delivery; and when such a result follows the examination, the patient always feels amply repaid for any inconvenience that may have been occasioned her by it.

Unless one adheres to the routine above described each case will remain to the end a mysterious uncertainty. This uncertainty, rather than the irregularity of the work, depriving one of sleep and interfering with one's office hours, accounts, I think, for the dislike of obstetrics felt by some of our present-day practitioners.

THE MANAGEMENT OF PREGNANCY.

BY RICHARD C. NORRIS, M.D.,

Assistant Professor of Obstetrics, Medical Department, University of Pennsylvania; Surgeon-in-charge, Preston Retreat, Philadelphia.

The general practitioner usually receives such meager compensation for his maternity work that any extra effort is burdensome to him. Observing so many cases without serious complications he can see little motive for urging his patients to consult him early in pregnancy for that supervision the value of which the specialist in the larger communities has learned to appreciate.

Not infrequently such supervision can prevent a miscarriage; retard or arrest an insidious tuberculosis; avoid a fatal eclampsia; or save an overtaxed heart and prevent it from being permanently crippled. Pregnancy complicated by tumor or flattened pelvis can be discovered, and with this foreknowledge a safe labor will be possible. A normal labor free from parturient and postpartum accidents is often obtained by fortifying the patient, during her pregnancy, against the demands made upon her vital energy—demands as inexorable as any the physician ever observes.

Women should be taught to seek their doctors early in pregnancy. After the second missed period an office consultation should be arranged for, a careful history should be taken, and an examination should be made. Diseases of childhood that may bear relation to kidney or cardiac disease, as scarlet fever, diphtheria, rheumatic fever, or their sequels, are to be noted. Anemia, tuberculosis, syphilis, gonorrheal or other vaginal discharge should tactfully be investigated. The type and date of the last menstruation, the probable date of conception if known, in multiparæ the history of previous labors and lying-in periods, should carefully be noted. When the value of an early pelvic examination is made known to the patient there will be little or no opposition to it. It should be made to confirm the diagnosis of pregnancy and to detect any pelvic disorder that might interfere with its progress. Pathologic anteflexion, retroversion, extensive laceration with erosion or retention cysts of the cervix, fibroid or ovarian tumors, ectopic gestation or tubal inflammation are to be excluded. Appendicitis antedating or complicating pregnancy

is distinctly more dangerous, and early surgical treatment is more urgently demanded than at other times. During the examination deep pressure of two fingers toward the sacral promontory will recognize flattening of the pelvis.

Retroversion should at once be corrected and the womb held in place by a pessary until the third month has passed. When the enlarged uterus is caught behind the sacral prominence its dislodgment may be so difficult that retroversion with adhesion may be suspected. The knee-chest posture and traction on the cervix with a tenaculum, the bladder having been emptied, are often necessary to obtain reposition. Incarceration will usually be associated with marked bladder disturbance and contraindicates violent manipulations. In very rare cases an anesthetic (ethyl chloride or chloroform) may be required.

Pathologic anteflexion or extensive laceration of the cervix is prone to cause abortion, which may be avoided by rest in bed or on a couch, at the menstrual epochs, during the earlier months of pregnancy. Lacerations with erosions and free discharge should be treated with applications through a speculum. I have found nothing better than ten- to twenty-per-cent solutions of argyrol, puncturing the cysts before the application is made. Glycerin tampons are best avoided; they carry some risk of inducing abortion.

A quiescent and hitherto undetected tumor must be clearly diagnosticated. If ovarian, it should always be removed, and at the earliest possible period of pregnancy. The history of neglected ovarian tumors of any size complicating pregnancy is a history of disaster; of operation for removal during pregnancy it is brilliant if done before the fourth month. Of 720 cases not operated upon the maternal mortality was 21 per cent; the fetal mortality 30 per cent. Of 299 ovariotomies during pregnancy the maternal mortality was 3.3 per cent, and when no complications existed at the time of operation, pregnancy was interrupted in only 11 per cent.[1]

When appendicitis has existed prior to pregnancy, a recurrent attack is usual and is liable to be grave, perforation and abscess having occurred in 50 per cent of such cases.[2] Fibroid tumors on the contrary rarely interfere with pregnancy or labor, but they require watching throughout the pregnancy and after delivery. Only when situated in the supravaginal cervix and clearly an obstruction to labor, or when inflamed or producing serious pressure symptoms, is operation indicated. Among 3000 deliveries under my care at the Preston Retreat fibroids complicating labor have never produced serious obstruction. Several times I have been ready to do a Cæsarian section, but each time the tumor was drawn out of the way during the progress of labor. Their greatest danger is of necrosis and infection during the puerperium. Within the month, however, I have delivered at term a patient from whom I removed a large obstructing fibroid by myomectomy at the fourth month of pregnancy.

The early examination not infrequently detects tubal pregnancy before rupture. A doubtful diagnosis will justify an exploratory operation. Having excluded any complication in the pelvic organs the patient should then receive verbal or, better, printed directions as to diet, rest and exercise, and other details of her daily life in order to place her under the best possible hygienic environment. Plain, nourishing food, an abundance of fruit and of water, milk between meals to lessen the appetite for an undue amount of red meats, at least eight hours' sleep at night, with an afternoon "siesta" for the irritable neurasthenic, are useful hygienic rules to enforce. The cark and care of the housewife should be relieved by outdoor exercise, walking or driving, and in the earlier months occasional diversion and amusement should be suggested. The wide-spread use of the motor car among well-to-do people has brought up the question of the dangers of this form of outing for a pregnant woman. Good roads, an easy pace, short, non-fatiguing rides in a car equipped with comfortable springs are conditions permitting the motor car to

[1] McKerron: Pregnancy, Labour, and Child-bed, with Ovarian Tumor. London, 1903.

[2] Myer: *American Journal of Obstetrics*, March, 1906.

women who have no habit of or predisposition to miscarriages. Exposure to very cold weather and riding during the menstrual epochs are always prohibited.

Advice as to bathing requires no change from the patient's habit—cold or warm baths, as has been her custom. Surf baths are likely to cause abortion.

Restriction of sexual life should be suggested, especially at the menstrual epochs, and at other times it may be regulated in accordance with the patient's desires or its ill effect, as shown in excessive nausea or other irritations of the nervous system. It is a good rule to instruct the patient to mark the days on her calender when her menstrual periods would occur, and to enjoin rest and quiet during those periods throughout the entire pregnancy.

A few words are desirable as to the dangers of constricting corsets and garters and of high-heeled shoes. Multiparæ find great comfort from a lightweight abdominal supporter, so applied as to lift the growing uterus without compressing it against the great abdominal vessels and the ureters. The breasts should be free from compression, and during the last month of pregnancy the nipples should be drawn out daily if retracted. To prepare them for the traumatism of lactation they should be cleansed with bland soap and water and touched with sweet oil at the morning toilet. At night a preparation containing an ounce each of tannin, glycerole, and water should be applied, the night-dress being protected from stain by a clean piece of soft linen.

Perhaps the most important instruction to be given at this first visit is the necessity of avoiding constipation and promoting activity of the liver function. The latter-day pathology of pregnancy gives first place to toxemia and to the liver function an important prophylaxis. It is my rule to direct that throughout a week of each month the following pill be taken at bedtime, one or more as may be required:

℞ Podophylli, gr. 1/24;
Pulv. ipecac., gr. 1/12;
Hydrarg. chlorid. mit.,
Euonymini, ää gr. ⅛;
Ext. rhei, gr. j.

And during the remaining three weeks of each month a laxative pill of aloin, belladonna, strychnine, and cascara, alternating the latter at times with Hunyadi, Apenta, or other saline mineral water. The occurrence of "bilious" attacks should be reported to the physician, and with toxemia in mind he visits his patient to critically study her for the various manifestations of toxemia, whether in the skin, the gastrohepatic, nervous, urinary, or circulatory systems.

Urinalyses.—Space is not at hand to discuss in detail the varied and conflicting conclusions as to the significance and practical importance of critical examinations of the urine of pregnant women. For our present purpose it will suffice to state concisely the practical rules I follow in my daily routine work. A twenty-four-hour specimen is collected once a month until the ninth month, and thereafter every ten days. The quantity voided is noted, and the following examination made: The specific gravity; percentage of urea; presence and quantity (by volume) of albumin; the character and number of casts. My case-books—private and hospital patients—show albumin in small quantity in 8 per cent of the cases. In hospital patients the proportion is a trifle higher—12 to 15 per cent—upon admission (at the ninth month), the proportion falling to 8 per cent after free daily purgation and the good but simple food of the hospital dietary. The presence of albumin in small quantity without casts is not of grave significance. Purges and a diet largely of milk will usually cause it to disappear. Urea estimations are no longer regarded as the most practical index of impending toxemia, since the percentage may have the widest variations within the limit of apparent health. They do not tell us the patient's intake of nitrogen, nor the amount given to the growing fetus, nor of the formation of the precedents of urea which are evidences of disturbed metabolism. When, however, the urea percentage is persistently low the constitutional signs of toxemia are looked for; and when nausea, a coated tongue, headache, constipation or diarrhea, increased arterial tension, edema uninflu-

enced by posture, and nervous irritability are associated with diminished urea excretion, it is then a danger-signal of great value. Urinalyses that estimate the proportion of the various precedents of urea, as ammonia, acetone, and other amide substances, by means of which acid intoxication and disturbed metabolism are determined, have thus far not reached a practical value so far as concerns the diagnosis of pregnancy toxemia.

Mild Affections of Pregnancy.—There are a few mild disorders of pregnancy about which and their treatment the patient should be informed. A troublesome vaginal discharge should always receive treatment. When a gonorrheal origin is suspected a cover-slip preparation is readily stained and the diagnosis thus made certain. For its treatment 25-per-cent solution of argyrol in gelatin suppositories and one-per-cent douches have given me satisfactory results. Thorough disinfection of the vagina when labor occurs, the avoidance of vaginal examinations, and the Credé prophylaxis of ophthalmia are routinely employed. For non-specific leucorrhea and its associated pruritus, douches, gently given, the syringe-bag slightly elevated above the level of the vagina, are indicated (lysol or zinc sulphate, one drachm to the quart). For the pruritus, after the douche a vaginal suppository is used, containing picric acid gr. j; extract of hydrastis, zinc sulphocarbolate, alum, of each gr. ij; and boric acid, gr. x.

When the usual local treatment of inflamed hemorrhoids fails to give relief, the clot in an external pile may be turned out under local anesthesia, and even internal hemorrhoids, if seriously infected, may be removed with safety during pregnancy.

Keeping in touch with the patient's progress the period finally arrives for the examination preliminary to labor. Two weeks before term a visit is made, the patient preparing for it by resting in bed loosely clad. Her general condition, circulatory system, and gastrointestinal functions should be investigated. The abdomen is palpated to determine the position and presentation of the fetus, and whether descent of the head into the pelvic cavity has occurred. Pelvic measurements should be recorded of all primigravidæ and of multiparæ whose histories indicate difficult or obstructed labors. When the head has entered the pelvic cavity, pelvic measurements may be omitted. In a doubtful case a vaginal examination should be made. Occiput posterior positions, with the head movable above the pelvic brim, in primigravidæ near term, very commonly cause difficult high forceps deliveries. In such cases the prevention of unduly prolonged pregnancy by the induction of labor at term and efforts to secure ample flexion of the head to insure prompt engagement I have always found desirable. The practitioner who has no skill in pelvimetry can at least learn the reach of his index and middle fingers, and when the sacral promontory is readily reached he will at once recognize a flattened pelvis. At this visit also the condition of the nipples is observed, a daily laxative is prescribed, the patient is reassured and encouraged, and the nurse's preparation of the armamentarium is explained. The following is a printed list given to the patient at her first office consultation; she is instructed to have this armamentarium in readiness after the seventh month of pregnancy:

FOR THE MOTHER.

Have ready towels, ether (2 quarter-pound cans); alcohol (eight ounces); hot water; a bottle of antiseptic tablets (corrosive sublimate); a new nail-brush; a fountain syringe; bedpan ("Perfection" bed and douche pan); new, soft-rubber catheter; one old sheet, linen or muslin (for binder); a one-pound package of salicylated cotton; a one-pound package plain sterilized cotton; fifteen yards of carbolized gauze; a one-yard package of absorbent lint; two medium size white agate basins; one pair surgeon's rubber gloves, size No. 7½; four yards of nursery cloth.

The last is to be boiled for half an hour in clothes boiler, dried thoroughly, pinned up in a clean sheet, and put away out of the dust. A mackintosh or rubber cloth is necessary to protect the mattress; two yards of rubber cloth, one yard wide, is sufficient. Prescription No. 1 is to be procured about four weeks before expected confinement. It is to be applied to the nipples at night, with absorbent cotton, the clothing to be protected from staining by a piece of clean linen.

Prescription No. 2 is for the baby (dressing for cord). (Acid. salicylici, gr. xx; pulv. amyli. 3j. M. Sig.: Navel dressing for the baby.)

Baby Clothes.

Four to six dozen diapers.
Four to six pairs knit (woolen) socks.
Three to four shirts (woolen).
Four flannel night skirts.
Four flannel day skirts.
Four to six white day skirts. (All skirts to be made with waists instead of bands.)
Six to ten slips.
Six to ten dresses.
Material for four or five flannel bands (45- to 50-cent flannel).
Soft pillow (good size, 14x18 inches).
Soft pillow covers.
Knit wrapping blankets.
Sacques, wrappers, bibs, caps, blankets, veils, etc.

Baby's Basket.

Large and small safety-pins.
Talcum powder (box and puff).
Fine, soft sponge.
Soft brush (for hair).
Castile soap.
Cold cream.
Alcohol for rubbing child.
Blunt scissors for nails, etc.
Old linen for cleaning mouth.
Soft towels for bath.
Bath blanket.
Wooden forms for drying socks.
Baby bath tub.
Baby scales (if desired).

THE MANAGEMENT OF NORMAL PREGNANCY.

BY BARTON C. HIRST, M.D.,
Professor of Obstetrics, University of Pennsylvania.

A woman expecting confinement should apply to the physician who is to attend her no later than the third month of pregnancy. She receives at the first visit the following routine and advice: The chief danger she runs in pregnancy is from toxemia, and the most important contributing cause of that condition is overtaxation of the kidneys and liver with imperfect elimination. Therefore she should be prudent about exposure to cold, wet feet, sitting in a draft, and insufficient underclothing. The food should be of such a character as not to tax the kidneys and liver, namely, no excessive indulgence of any kind; no excess of sweets; meat but once a day, and red meat not oftener than three times a week. The bowels must be regulated; the best routine prescription is the pill of aloin, belladonna, cascara, and strychnine; as substitutes, a mixture of syrup of figs and cascara, phosphate of soda, Carlsbad water, or Lady Webster's pills may be used.

Specimen of urine should be sent to the physician once in two weeks till the last month, then once a week. Examinations for albumin, specific gravity, and sugar should be made routinely. If there is any abnormality in the urine or any symptom in the patient, such as headache, defective vision, rapid pulse, edema, foul tongue, or dyspepsia, a microscopic examination of a centrifuged specimen, an estimation of the urea output, and, if possible, a determination of the nitrogen partition should be made.

To preserve the teeth, which are prone to decay in pregnancy, the patient should be instructed to use milk of magnesia as a mouth-wash morning and evening, and to take a course of the syrup of the lactophosphate of lime, two drachms three times a day, for two weeks at a time off and on during the whole of gestation.

Dentists attach the greatest importance to the acid secretions of the mouth as a cause of caries in the teeth, and therefore believe that the antacid mouth-wash is the most essential remedy. The patient should report in the doctor's office about once a month, and at the last visit, a month before labor, a routine pelvic and abdominal examination should be made to determine pelvic and fetal size, fetal position, and any abnormality that might obstruct labor.

In regard to physical effort the patient should be cautioned in the early months against overexertion, prolonged standing on the feet, violent exercise of any kind, a sudden jolt or jar, and movements of the body that strain the abdomen, namely, lifting heavy weights or raising the arms above the head to exert muscular effort, as in opening a window or lifting a weight down from a closet shelf. Later in pregnancy a short, leisurely walk daily in the open air

should be recommended if the weather is not inclement. Two weeks before labor it is an advantage to give one-thirtieth of a grain of strychnine three times a day. It increases the vigor of the labor pains when labor begins.

As there are a number of small details for the patient to remember, and as there are a number of things to provide, a printed list such as is appended below should be handed the patient:

FOR THE MOTHER.

Send a specimen of urine (mixed night and morning), about four ounces, every two weeks until the last month, then every week. Report at once scanty urination, bad headache, swelling of the feet or face.

Have ready for the labor: Towels, ether (one-half pound); brandy (two ounces); vinegar (four ounces); four ounces tincture of green soap; a bottle of antiseptic tablets (corrosive sublimate); a large, coarse, new sponge; a skein of bobbin; a fountain syringe; bedpan; new, soft-rubber catheter; a small package of absorbent cotton; a one-ounce bottle of carbolized vaselin; two yards unbleached muslin (for binder); a one-pound package of salicylated cotton; five yards of carbolized gauze; eight yards of nursery cloth.

The last is to be boiled for half an hour in clothes boiler, dried thoroughly, pinned up in a clean sheet, and put away out of the dust. A mackintosh or rubber cloth is necessary to protect the mattress; two yards of rubber cloth, one yard wide, is sufficient. Prescription No. 1 (Glycerole of tannin, aq., ää f℥jss; ol. rosæ, gtt. ij; apply externally as directed to the nipples) is to be procured about four weeks before expected confinement. It is to be applied to the nipples, night and morning, with absorbent cotton. Prescription No. 2 (ergot) is to be gotten about a week beforehand and kept in readiness.

Baby Clothes.

Four to six dozen diapers.
Four to six pairs knit (woolen) socks.
Three to four shirts (woolen).
Four flannel night skirts.
Four flannel day skirts.
Four to six white day skirts. (All skirts to be made with waists instead of bands.)
Six to ten slips.
Six to ten dresses.
Material for four to five flannel bands (45- to 50-cent flannel).
Soft pillow (good size, 14x18 inches).
Soft pillow covers.
Knit wrapping blankets.
Sacques, wrappers, bibs, caps, blankets, veils, etc.

Baby's Basket.

Large and small safety-pins.
Talcum powder (box and puff).
Fine, soft sponge.
Soft brush (for hair).
Castile soap.
Cold cream.
Alcohol for rubbing child.
Blunt scissors for nails, etc.
Old linen for cleaning mouth.
Soft towels for bath.
Bath blanket.
Wooden forms for drying socks.

If the patient is willing to incur the additional expense, everything needed in the labor may be procured in a box, each article sterilized and ready for immediate use:

"VAN HORN" OBSTETRICAL OUTFIT NO. 4,
As prepared for Dr. Barton C. Hirst, Philadelphia.

Ten yards sterilized gauze.
Two sterilized bed pads (30 inches square).
Two sterilized mull binders (18 inches wide).
Six sterilized towels.
Stocking drawers, sterilized.
Ten yards sterilized gauze.
Five yards carbolized gauze.
One pound package salicylated cotton.
One pound sterilized absorbent cotton (½ lbs.).
Rubber sheet 1 yard by 1½ yards, sterilized.
Rubber sheet 1½ yards by 2 yards, sterilized.
Two tubes sterilized petrolatum.
One tube K-Y lubricating jelly.
Tincture green soap.
Fluid extract ergot.
100 grammes chloroform (Squibb's).
100 grammes ether.
Boric acid, powdered.
Bichloride tablets.
Talcum powder.
Four-quart sterilized douche-bag with glass nozzle.
Douche pan, sterilized.
Two agate basins, sterilized.
Bath thermometer.
Sterilized nail-brush.
Safety-pins.
Sterilized tape.
Sterilized soft-rubber catheter.
Sterilized glass catheter.
One pair sterilized rubber gloves, No. 7½.

These materials being cleansed and sterilized are ready for use at any time.

This complete outfit is packed in a neat box, thus enabling the contents to be kept intact until needed.

At the patient's first visit to the physician she should be given a list of about a half-dozen competent, reliable nurses, to choose from the number the one whose personality she likes the best.

ARTIFICIAL FEEDING OF INFANTS IN PRIVATE PRACTICE.[1]

BY M. HOWARD FUSSELL, M.D.,
Assistant Professor of Medicine in the University of Pennsylvania.

My experience as a general practitioner has been long enough for me to have tested the various methods of infant feeding. Until Rotch brought the system of modifying milk to a scientific basis I, in common with most doctors, was hopelessly changing from one mixture of milk and cream to another, and from one proprietary food to another, chosing the one which was most advertised. The result was hopeless confusion and much sickness among my artificially fed babies.

The use of modified milk on a fixed and scientific basis has proven most satisfactory and convenient.

When I first read Rotch's books and his formulæ the whole subject seemed a mere mass of figures to me. As a matter of fact, when the principles are thoroughly grasped, modification of milk is a simple matter when we have at hand the text-books for guides. I have used the milk laboratories to a certain extent, but they are too expensive for the ordinary individual, unless the person chances to live in close proximity to them, and home modification is perfectly practicable and satisfactory in the great majority of cases.

In regard to the advantages of modified cow's milk over the many patent foods, it is a well-known fact that in a considerable percentage of cases which have been fed upon artificial foods, and apparently successfully fed, scurvy and rickets are pretty sure to supervene. So far as I know, this never takes place when some mixture of fresh milk is used.

Some years ago I reported three cases of infantile scurvy following the use of a well-known proprietary food.

It may be interesting to digress a moment and state these facts. The cases were reported April 8, 1902. Before being read the editor of a well-known and extensively read journal wrote me asking for the privilege of publishing the paper. After the meeting the manuscript was sent to the journal. It was promptly returned to me by the editor with a polite note saying the publishers would not print it because it contained the name of the artificial food, and that the manufacturers of this particular food were large advertisers in the journal. For business reasons, therefore, it could not be accepted. The paper is still in my pigeonhole.

As illustrating the point I have made of scurvy following the use of artificial foods which have been used, with apparent success, I will quote one of these cases in abstract:

Baby M., female, aged thirteen months; weighed five pounds at birth. The mother nursed the infant but a very short time because her milk ceased to nourish the child. The child was put upon a cream and milk mixture. After many trials a formula was found upon which the child slowly improved. When eight months old she weighed 12 pounds. At this time the mother and child went on a visit to a neighboring town and did not return to my care until September, 1901. When a year old the baby weighed 14 pounds and was dull and listless. While away from home the patient ceased to improve upon the milk formula it was using; a very able practitioner was consulted, and a mixture of condensed milk and an artificial food was prescribed. Upon this mixture the patient seemed to thrive. When the family returned I was informed of what had taken place, and was shown the apparently well-nourished child as an evidence of the superiority of artificial foods over milk and cream food.

One month after the patient came under my care the second time, and while it was still taking the artificial food, it was noticed that there was a disinclination to use the left leg. The child would lie on its back, move both arms and the right leg, but when the left leg was moved it would cry out with pain. At first the evident pain was thought to be due to a twist that was known to have been received. Soon, however, neither leg would be moved voluntarily; it was then noticed that the skin of the face was very edematous; both tibiæ became much swollen and extremely tender to the touch; the gums were normal, but there were no teeth. The food was at once changed to a laboratory mixture of milk and cream. The immediate improvement in the child's condition was little less than marvelous; within three days the legs could be handled without the

[1]Read before the Philadelphia Pediatric Society, Nov. 13, 1906.

child giving any signs of pain. At first there was a rapid loss of weight owing to the disappearance of the edema; within a week, however, the child began to improve, and she now weighs more than at any time in her life, stands on her feet for the first time in her life, and is altogether an entirely different individual.

Another case came under my care last evening. A child twenty months old was brought into my office with the history that she was the surviving one of twins. Soon after the birth of the twins the mother's supply of milk failed. The children were fed on condensed milk and oatmeal. Both children suffered during the summer with enterocolitis; the one died. This surviving one has had diarrhea most of her life, has never crept nor walked, is pale, ill nourished, has a slight fever. The fontanel is open, there is beading at the junction of the costal cartilages and the ribs, and enlargement of the wrist and ankle joints. It is a typical case of rickets. These are but two instances of many of the kind which have come to my notice. Many such occurred in my own practice before I gained wisdom and took the trouble to take care of the children.

The great reason why we are unsuccessful in feeding children is because it is such an easy matter to say to the parents: Feed the child on condensed milk; use the formula directed upon the can. This failing we are prone to try this food and that food until the child either drifts into the hands of another practitioner or dies, or mayhap by good fortune begin to improve, often later to come to us with scurvy or rickets. And it takes considerable time and trouble to teach how to modify milk.

Another reason, and perhaps quite as potent as the doctor's neglect, is the fact that neighbors are constantly advising the mothers to use this or that food when the child is ill fed, in spite of the doctor's direction.

The reason why modification of milk does not succeed when a consultant advises its use is because we doctors do not understand its principles, and one or two visits by the consultant are useless, unless we take pains to learn and apply these principles to the case in hand. I advise all doctors to take down their Rotch and their Holt, take a day off, grind the principles into their minds and follow them. Success and great comfort both for themselves and the families they treat will surely follow.

I have no doubt that my method of using this most helpful adjunct may not be all which a skilled pediatrist would wish, but it works and works well, and I have relatively little trouble.

In the beginning I write or have copied these directions for home modification:

First.—Select a good dairyman who will give you fresh, pure milk.

Second.—Buy a Chapin milk dipper.

Third.—Have the milk delivered in a clean quart bottle.

Fourth.—Allow the bottle to stand on ice six hours.

Fifth.—Take eight dipperfuls from the top of the quart of milk. Use these eight dipperfuls as *cream*. Use the remainder in the bottle as *milk*. I then leave with the mother a written formula which I deem fitted for the particular case.

These directions are gone over carefully; if need be, a mixture is made by myself in the presence of the mother, for simple as the procedure is to me, and as it in reality is, a demonstration is much more efficacious than is the mere telling or reading of directions.

Now, as to my own part in remembering the formulæ. I do not attempt to memorize them; I always carry with me cards upon which I have copied three sets of directions:

1. A card holding the proper amount of food and the proper intervals for given ages:

Age.	Interval. Hours.	No. feedings in 24 hours.	No. feedings in night.	Amount each feeding. Ounces.	Total amount. Ounces.
1 week	2	10	1	1	10
2 weeks	2	10	1	1½	15
4 weeks	2	9	1	2½	22½
6 weeks	2½	8	1	3	24
8 weeks	2½	8	1	3½	28
3 months	2½	7	0	4	28
4 months	2½	7	0	4½	31½
5 months	3	6	0	5½	33
6 months	3	6	0	5¾	34½
7 months	3	6	0	6¼	37½
8 months	3	6	0	7	42
9 months	3	6	0	7	42
10 months	3	5	0	8½	42½
11 months	3	5	0	8¾	43¾
12 months	3	5	0	9	45

2. A card giving the proper proportion of sugar, proteids, and fats for given ages:

Age.	Percentage of fat.	Percentage of sugar.	Percentage of proteids.
24 to 36 hours	...	5	.....
First week	2	5	.75
Second week	2.5	6	1
Third week	3	6	1
4 to 6 weeks	3.5	6.5	1
6 to 8 weeks	3:5	6.5	1.5
2 to 4 months	4	7	1.5
4 to 8 months	4	7	2
8 to 9 months	4	7	2.5
9 to 10 months	4	7	3
10 to 10½ months	4	5	3.25
10½ to 11 months	4	4.5	3.5
11 to 11½ months	Unmodified	cow's milk.	

3. A card showing the proper manner of manufacturing at home given percentages of sugar, proteids, and fats:

Percentage of fat.	Percentage of sugar.	Percentage of proteids.	Cream, 12 per cent.	Milk, fat free.	Lime water.	Boiled water.	Milk sugar.
.5	5	2	3½	9½	1	8¾	¼
.75	6	1	1¼	3½	1	14	½
1	5	.75	1½	2½	1	15	⅜
1.5	4	.5	2⅛	1¼	1	16¼	⅜
2	5	.75	3	1	1	15	1
2	5.5	1	3	2¼	1	13⅛	1
2.5	6	1	4	1½	1	14	1
3	6	.5	X	X	X	X	X
3	6	.75	5	..	1	14	1
3	6	1	4½	5¼	1	13½	1
3.5	6.5	1	5½		1	13⅛	1
3.5	6.5	1.5	5½	2¼	1	11	1
3	7	1	4½	3¼	1	13½	1
3	7	1.5	4½	3¼	1	11	1
3	7	2	4½	5½	1	8¾	1
3	7	1	X	X	X	X	X
4	7	1.5	6¼	1¾	1	11	1
4	7	2	6¼	4¼	1	8⅛	2⅛
4	7	2.5	6¼	6¾	1	6	2
4	7	3	6¼	9¼	1	3⅛	2
4	6	3	6¼	9¼	1	3⅛	2
4	5	3	6¼	9¼	1	3⅛	1¼
4	5	3.5	6¼	11¾	1	1	⅛

X.—Impossible mixture with this cream and milk.

These cards I have copied from Rotch and Holt. I believe the last is the original work of our fellow associate, Dr. Westcott.

Necessarily these are hard and fast rules, and will not answer in all cases, though they will in the majority of instances. When I find that the particular formula which I have selected does not agree, if the baby cries, if it vomits, if it has diarrhea, I change my formula, giving that which my experience has taught me is best.

I am always careful to begin with a very weak food, and carefully work up to that which is nearest in proportion to mother's milk, namely, 4 per cent of fat, 7 per cent of sugar, and 1.50 per cent of proteids.

I have now a sad confession to make. When the formula which I have selected does not agree with the infant, I am always in somewhat of a quandary as to which particular element is doing the harm, the fat or the proteid. I get over this uncertainty easily and safely, however, by at once dropping to a formula which is weak in both fats and proteids, and again gradually work up. In the great majority of instances I find that the food weak in proteids, and relatively strong in sugar and fats, is the one usually best borne. Of course, there are many instances in which the fats are not borne well, and they are easily discovered by daily manipulation of the formulæ on this third card. Now, these words, fats, proteids, and sugar, in common with the formulæ indicating their proportions, at one time seemed mere Yiddish to me. Doubtless my education was neglected, as indeed it was in those particulars, but if instead of thinking about a food having so much milk, so much cream, and so much water, we will study well these three cards and think of the food as composed of proteids, fats, and sugar, after a short while everything will be clear sailing, and we shall have comfort in certainty, and our babies will live and thrive.

Some one may ask, is all the scientific work which has been done upon artificial foods valueless? Are such foods never of any use? Such foods are certainly a delusion and a snare if we depend upon them absolutely, or chiefly even. As a makeshift they are of value. I still use them occasionally, when for some reason I am handicapped by bad milk, ignorant mothers, my own failure to grasp the case, or in the really rare instances when no milk however carefully prepared appears to suit the case. I have found them of value in such instances, but I never use them long. They are for the greater part rich in carbohydrates, and while some of them contain about a normal amount of proteids they are all poor in fats, and it is well known that there is lacking some element necessary to the proper nourishment of the infant.

Almost as important as the character of food given is the amount and intervals at which the food is administered. It matters

little how correct the formula is, if the little patient whose stomach normally contains two ounces is allowed to gorge itself with two or three times that amount, dire results are sure to follow. Therefore the card which I have shown containing the proper amount of food at a given age is just as necessary to have about you as are the other two.

In conclusion, then, experience has satisfied me that a modification of milk is practical for feeding infants.

Much attention must be given to the details, and among the poor and ignorant many lessons must be given, and care taken that good milk is used in proper proportions.

The trouble will be paid for by the fall in morbidity and mortality of artificially fed children under our care.

THE CLINICAL SIGNIFICANCE OF VARIATIONS IN BLOOD-PRESSURE.[1]

BY H. A. HARE, M.D.,

Professor of Therapeutics in the Jefferson Medical College of Philadelphia.

Although several other papers have been contributed to this symposium the title of the part which has been assigned to me is alone sufficient in scope to cover a field too large to be adequately considered in an entire evening. There is assuredly no topic which can be discussed with greater benefit to ourselves or to those who may be interested in our proceedings than this, because the variations which take place in blood-pressure will, if carefully studied, be a source from which we may gain most valuable ideas as to the diagnosis, prognosis, and treatment of an immense number of conditions due to acute or chronic disease. It is important to recall the fact that very great variations occur in health under the influence of exercise, rest, sleep, digestion, mental processes, and time of day, and it is equally important to remember certain physiological facts which practitioners are prone to ignore, partly because they wilfully forget physiological facts in distinction from pathological facts, having the extraordinary idea that physiology is a science which has to be studied before graduation and that pathological facts are the only ones of interest to the practitioner. Nothing can be more erroneous and nothing more destructive of an ability to grasp and utilize bedside observation than this delusion.

The first physiological fact to be recalled is that the vascular system is not a mere arrangement of conducting tubes through which the blood passes as water passes through a set of pipes when driven by a pump. On the contrary, there is no more complex and active mechanism in the body than the vascular system, and the laws of physics are combined with laws of arterial physiology in as complex a manner as are the laws of optics combined with the functions and tissues of the eyeballs. The whole apparatus is not only composed of elastic tissues, muscular tissues, and fibrous tissues which adjust themselves to the needs of the moment, but it is under the control of a vasomotor center in the medulla, and of a host of widely-scattered subcenters which respond not alone to the chief center but to many other influences. Again, this nerve supply not only possesses fibers which carry constricting influences, but dilator fibers; in other words, vasodilatation is quite as much an active process as constriction, although we are prone to regard it as passive and to think of vasodilatation as if it were due to nervous inactivity in every case. Further than this the circulatory system is so well arranged that dilatation in one part, because of increased function in that area, is compensated for by contraction elsewhere, and large vascular networks are prepared at a moment's notice to relieve excessive pressure by receiving blood in large quantities. It is this very elasticity of function that makes health, and any interference with it brings disease, old age, and death. To use the words of

[1] Part of a Symposium on Blood-pressure before the Pathological Society of Philadelphia, Jan. 24, 1907.

Leonard Hill, "A high pressure main runs to all the organs of the body. By means of the vasomotor nerves its contents can be turned on here and there, and any part flushed with blood, while the supply to the remaining parts is proportionately diminished."

A third and perhaps the most important vascular function is the elasticity of the vessels, both laterally and longitudinally, an elasticity which responds to the throbbing of the heart with every beat, an elasticity which permits the heart to labor without overworking, and which aids in urging on the blood stream into the capillaries, and even into the veins. This elasticity is as vital for normal function as the perfect yielding and resistance of the spring in a watch, and, to use a commercial phrase, its existence maintains a "community of interest" which is essential to life.

When we come to the study of abnormal arterial tension we find that we have to consider cases in which the tension is too high and others in which it is too low, and if time permitted I could discuss an important group of cases in which local states of hyper- and hypotension are of considerable importance. The latter types will not be taken up at this time.

Taking up cases of high tension first we find that we can consider it as normal and pathological. The normal cases are those in which the tension is raised to a point above normal by exercise or excitement, such tension being a natural or physiological response. This form of high tension possesses no interest for the clinician unless it is associated with the presence of a weak heart or is so great and prolonged that it produces cardiac distress or injury. It is the form of high tension that frequently damages the heart of the sedentary man who suddenly decides that he needs exercise and takes it in strenuous and excessive degree. I think we can all recall cases of this kind, particularly in men about or beyond middle age. Another type of normal high tension, in one sense of the word, is met with in the stage of onset of acute febrile diseases when it may be an effort on the part of the body to supply more blood to all areas for protective purposes, for all large capillary networks are poison destroyers. Still another normal or beneficial type of high tension is the high tension of intracranial injury or disease, in which states Cushing has shown us that the rise is essential to the preservation of life. In early CO_2 poisoning the rise of tension is designed to send more blood to the respiratory center, and the rise due to severe pain, as in renal colic, lead colic, and labor, may all be advantageous. In the latter case (labor) I have elsewhere pointed out that it is this rise of tension produced by pain that permits women in labor to take chloroform with relative impunity. These facts should make us cautious in the use of vascular relaxants, unless we are certain that the high tension is useless and actually harmful. If Cushing is right, how many persons have been hurried to their end by bleeding in apoplexy.

Leaving those types of high tension which are solely due to increased functional activity of the vasomotor and vascular system, we step into the cheerless and tortuous path of persistent or chronic vascular spasm and fibrosis, a state toward which each and every one approaches as years go by, a state which affects physicians, lawyers, bankers, and financiers—forgive the association of pursuits—more frequently than any other class of individuals.

High tension of this persistent type often tells of the habits of the patient in the past and present, and directs us to the study of his heart, his kidneys, and his retinal vessels in a way that must not be ignored. In some instances there can be no doubt that a large part of the hypertension is functional in the sense that it is not entirely due to actual organic changes in the vessels; in other instances it is almost entirely due to the presence of fibroid change and the ability of a strong heart to pump vigorously. In some the spasm is due to great nervous strain and the use of stimulants, in others it is due to poisons in the blood, and in the functional type the very existence of these factors for long periods of time results in actual lesions. Brunton has recently advanced the view that not only

does high arterial tension do harm by interfering with the nutrition of the tissues, but also by interfering with the nutrition of the vessels themselves. Thus he points out in his usual lucid way that the high tension compresses the vaso-vasorum between the inner coats and the fibrous coat, which is fixed, because it has reached the point of fixation by distention. Again, he advances the view that the normal constant expansion and contraction of vessels in health, like massage, maintains and aids the blood flow in the vaso-vasorum.

What is the significance of high tension as to the heart? If its sounds are approximately normal we learn that it is still a fairly healthy organ, able to stand up to its work, but we must bear in mind that in many men past middle life a state of increased tension exists which is not appreciated because the heart has gradually become accustomed to the strain. The stress and strength are so nearly balanced that when a sudden increase in exertion is made, as in running for a car, or taking any form of violent exercise, dilatation due to overstrain at once develops. Abnormal increase in tension means increased work for the heart muscle, and increased strain upon its valves, particularly the aortic and mitral leaflets. The result of this strain is speedily manifested in a previously normal heart by hypertrophy with associated dilatation, in a previously feeble or diseased heart by dilatation with increase in its feebleness, in failure of the mitral valves to stand the great pressure brought to bear on them with each systole, a failure increased in effect by the fact that the mitral rim is feeble also, so that mitral regurgitation takes place, the result being that the blood finds it as easy to slip back into the auricle as to pass out into the aorta. The mere high tension due to narrowing of the arterioles is not alone responsible for this cardiac disaster; the very fixation of the vessels increases the work of the heart, and with fixation come elongation and tortuosity, which demand increased cardiac effort. The heart now fails not alone from overwork, but in addition it may begin to develop degenerative changes in its fibers, for the same factors that act deleteriously on the muscular fiber of the vessel wall also act on the more specialized muscular fibers of this organ.

Time does not permit me to go into the discussion of whether arterial spasm and fibrosis is the cause or result of renal disease. It is sufficient for us to know that renal disease is often present, and that the prognosis depends very largely upon its degree. So, too, the changes in the retinal vessels, so well studied by Hirschberg and Gunn in Europe and by de Schweinitz in this country, are of great prognostic and diagnostic value, the presence of compressed vessels showing high tension, and the presence of retinitis indicating grave danger from vascular rupture and toxemia.

In this connection it is essential to emphasize a fact which should control us in all our work, namely, that we must not reach an opinion as to the condition of a patient from the signs offered by any one part, nor must we regard it as more than probable that because the vascular system seems fibroid in one area it is universally so in equal degree. How often do we see persons with marked degenerative changes in the radials whose retinal vessels look as if they were those of a child; and how frequently we see patients with severe retinal changes, such as pressure and hemorrhage, who have good radials and withstand great vascular stress. Again, it is essential to study more than one vessel to determine the degree of tension. How often does one radial seem tense and the other normal. I am constantly impressed with the frequency with which the right and left radial artery gives us a different conception of the tension actually present.

In walking cases it is an evil practice to attempt to determine the tension until the patient has had twenty-four hours' rest in bed. Not rarely the exercise of walking, or the excitement of the visit, raises tension to an exaggerated degree, or if the heart is fatigued the pressure may be abnormally low, although vascular spasm and fibrosis at other times make it high.

Another question of importance is

whether an abnormally constant high tension is always evil and ought always to be reduced. Are we to regard it as an evil to be attacked, or recognize that it has become a necessary and unavoidable evil? I believe that the present attitude of the profession in regard to high tension is tending to the abuse of vascular relaxants in many cases for the following reasons: It is a question whether high tension may not be designed by nature to drive blood through narrowed vessels to distant parts for their proper nutrition. If we lower pressure by relaxants of the larger arterioles and arteries we starve distant tissues. Again, the heart in many cases of high tension has undergone compensatory hypertrophy, and this increased power and the high tension help to feed the heart muscle itself through the coronary vessels and the vessels of Thebesius. Again, the normal heart is designed to beat against a pressure of from 100 to 140 millimeters of mercury, and nothing exhausts a heart so rapidly as to beat excessively because of low pressure. I am inclined to think that very often the hypertrophied heart of high tension may be considered to have established for itself a new standard of pressure, say of 130 to 170, and if we reduce this we may produce a state which may be considered as abnormal as is a pressure below the true normal. I am certain I have seen this condition again and again. In other words, in studying high pressure, it is not sufficient to study the pressure alone. We must study the whole cardiovascular apparatus. We must endeavor to prevent an increase in tension, but we must not reduce tension simply because it is high unless we find that the heart cannot stand the stress, or that the pressure is so high and vessels so fragile that rupture is threatened.

Having considered some of the facts which concern hypertension in the arterial system, we have still before us the study of hypotension. Such a condition, as a chronic state, is rare as compared to hypertension, and is most frequently met with as a part of some suddenly developed condition in the course of an acute illness, or as a result of accident.

When the hypotension is chronic it depends, in the great majority of instances, upon feebleness of the heart muscle, but in one particular malady at least we have a persistent low tension not so much as a result of cardiac feebleness as of vascular relaxation, namely, exophthalmic goitre, in which disease the thyroid secretion acts as a powerful vascular sedative. Indeed, I am inclined to believe that much of the tachycardia of Graves's disease is due to the lack of resistance in the arterioles to the flow of blood. The hypothesis may be advanced that ordinarily normal tension is maintained at least in part by a balance between the effects of thyroid secretion and adrenal secretion, and if this is true then adrenalin, if properly administered, might be of value in this malady.

Not rarely in neurasthenic persons, or persons who are suffering from the after-effects of an acute illness, hypotension is an important factor. Thus, I have seen persistent diurnal somnolence exist while the patient is up and about, replaced by marked nocturnal wakefulness as soon as he lies down. This state is due to a low tension which prevents an adequate supply of blood to the brain, which organ immediately becomes active as soon as the recumbent posture is assumed.

But after all the state of hypotension is met with most frequently in acute illness, and it is usually of far greater gravity, when it is marked, than is hypertension, because it indicates lack of power, nervous and circulatory, and because we have no remedies upon which we can rely as all-powerful vascular stimulants as we can rely on the nitrites as all-powerful relaxants.

This condition of hypotension in acute illness may be considered under two headings: The first type is met with at the critical period of acute infections, of which the most noteworthy is, perhaps, croupous pneumonia. It is not uncommon to find in these patients at this time a state bordering on collapse: the face is anxious, the forehead, wrists, and the trunk bedewed with sweat, the pulse very full, but the arteries relaxed, and the heart's action excessive,

as it actively endeavors to fill the leaking vessels, which do not offer the normal resistance to its action. This state depends chiefly, if not entirely, upon vascular hypotonus; the man is bleeding into his own vessels, and the treatment calls not for cardiac stimulants so much as for vascular stimulants, such as strychnine and atropine.

Again, in the course of one of the prolonged acute infections, such as enteric fever, for example, how often have we all of us stood by the bed with the fingers on the pulse, and felt the relaxed vessel with its large, full, but low tension wave, and at the same time thought hard for some vascular stimulant which would save the heart by restoring normal vessel tone. The therapeutic proposition is not so easy in such a case because the condition is gradual in its onset, and depends not upon a sudden fall of temperature, which results in relaxation due to the loss of that powerful stimulant, heat, but upon toxemia and feebleness of the general nervous system. Another cause in these cases is probably a degenerative change in the muscularis of the vessel wall, so that it cannot be materially affected by treatment. I have met with this state chiefly under two circumstances: (*a*) when profound toxemia has existed, and the vessels have degenerated, a state which is often present in typhoid fever unless prevented by the cold bath; (*b*) when strychnine has been used as stimulant for several days or weeks instead of being withheld for emergencies, as it ought to be. These states are met with commonly in influenza as well as in typhoid fever, and of course complicate other asthenic toxemic diseases.

When discussing hypertension I was careful to emphasize a point which I strongly believe in, namely, that in some conditions a tension which is above normal (and so essentially hypertension) is not rarely present in moderate degree as an endeavor of the body to meet a need. I am also firmly convinced that sometimes a moderate degree of hypotension is in one sense physiological in some illnesses, and should not be interfered with. In the middle stages of typhoid fever, when the circulatory excitement of onset has passed by, the system "settles down," so to speak, to the task of meeting a prolonged strain. The physician who whips up the circulation at this time, solely because the tension is low, forces his patient to an expenditure of energy which is wasteful and dangerous. It is only when overaction of the heart is due to low tension, or when renal or pulmonary stasis results from this cause, that interference is required.

In other words, when we are studying hypertension and hypotension we must combine our recognition of these states with the recognition of their relationship to other states, and perceive that they are but a part in the very complex problem before us. Neither high nor low tension is in itself evil if within certain bounds. Indeed, each may be salutary.

In conclusion I may be pardoned if I resort to the somewhat ancient method of expressing my ideas as to the therapy of high and low tension by a parable:

A landsman having taken passage on a ship became greatly alarmed as the vessel rose and fell during a gale. He therefore besought the captain to force the ship to lie on an even keel, but he was told that the rise and fall of the ship was enabling it to ride out the gale, and that if no rise and fall occurred the condition would be desperate because it would mean that the vessel was waterlogged.

The friends of a man acutely ill became greatly alarmed because his blood-pressure rose and fell. They therefore besought the physician to force these functions to "lie on an even keel," but the wise physician assured them these were natural manifestations of illness, that it might bring disaster to interfere with them, and said "when these variations from the normal become harmful, it will be time enough to correct them."

It is as unwise to give drugs to the patient simply because his arterial tension is high or low as it is for the captain to meddle with a ship because she does not lie on an even keel.

EDITORIAL.

THE IMPORTANCE OF TREATING THE PHARYNX AND TONSILS IN THE EARLY STAGES OF SOME ACUTE INFECTIONS.

In the old days, before our knowledge of bacterial infection was as complete as it is at present, the fact that the tonsils were frequently found to be inflamed in cases of acute illness and rheumatic affections gave rise to the belief that the tonsillar state was the result rather than the cause of illness, and on this basis a very considerable number of practitioners were wont to administer the salicylates and quinine in full doses with the idea that the rheumatic poison, so-called, or malarial poison, was responsible for the local inflammation in these glands. Indeed, the salicylic acid treatment of tonsillitis still remains a popular method, and there is considerable evidence to show that it is quite useful, even if the original reason for its employment has been found to be incorrect.

Recent investigations, combined with clinical studies, have proved again and again that the tonsils in the majority of instances act as an efficient barrier against the entrance of infecting microörganisms into the general system, and the swelling of these glandular tissues after exposure to certain infections is undoubtedly the result of a battle royal between the resistance of the individual and the parasites which are attacking him. It is quite interesting to note how frequently symptoms of general infection, as represented by chilliness, mild fever, backache, and general muscular soreness, will be found to be associated with the appearance upon the tonsils of follicular exudation and swelling in these parts; and again, it is interesting to note that for some reason, which is as yet unexplained, the salicylate of cinchonidine in particular serves to diminish these disagreeable symptoms, particularly if it is combined with some more powerful salicylate, like salicylate of strontium, and if at the same time a gargle of peroxide of hydrogen in water is used for its local effect upon the septic condition of the pharynx and tonsillar tissues. Of course, in cases in which the general systemic infection has become marked, the local treatment cannot be expected to produce very material results, but in the early stages of those infections which take place through the tonsils local treatment is often exceedingly advantageous, not only when peroxide is used, but when other antiseptics are employed. In this connection the well-known use of frequent small doses of biniodide of mercury is to be borne in mind.

Our attention has been again called to this subject not only by constant personal experience along these lines, but by a paper contributed to the *Boston Medical and Surgical Journal* of November 29, 1906, by Goodale. He pays particular attention to the presence of tuberculosis of the tonsils and of infectious arthritis arising through the entrance of pathogenic organisms by this pathway. In some instances it is possible that the symptoms arise from the absorption of toxic material rather than by the actual entrance of the germs themselves. Goodale asserts that the examination of a large number of cases of infectious arthritis with regard to the condition of the tonsils has demonstrated the existence of pathological alterations in the tonsils characterized in general by retention of lacunar detritus, with or without hypertrophy of the organ. He even goes so far as to suggest that where inspection fails to reveal deep-seated collections of detritus it is wise in some cases of arthritis to extirpate the tonsils in order to remove a source, or nest, of infection. Of course, such advice only holds good in those cases in which as the result of disease the tonsil has become distinctly pathological in its condition. To remove tonsils which are to a large extent healthy would, it seems to us, simply remove one of the barriers introduced by nature in the

pathway of infection, but chronic cheesy tonsils should always be regarded as areas from which invading microörganisms may descend upon the general system of the patient. It follows, therefore, that even if the patient suffers from no discomfort in his tonsils, these tissues should be carefully treated, and they may be removed, particularly if they are the only infecting source which can be discovered.

THE QUESTION OF CLIMATE IN THE TREATMENT OF TUBERCULOSIS.

In its ceaseless struggle with tubercular infection the medical profession is from time to time driven into the acceptance of certain views which are promulgated by professional leaders, or by those who make a specialty of treating cases of this character. In many instances the struggle seems to be so difficult and the results so doubtful that both the patient and his physician grasp at straws, which seem to be floating upon the river of possible recovery, only to find that they are of little more value than real straws are to the drowning man. For many years the profession did not know of the infectious nature of tuberculosis, and long after it recognized it unwisely pinned its faith upon the employment of drugs in an attempt to cure it. Better conceptions of the tubercle bacillus and the pathological processes which it engenders have however convinced most practitioners of the present time that drugs are of very little advantage, and can only be expected to do good when they combat certain symptoms or conditions which arise as complications of the tubercular infection. Indeed, in many cases there can be no doubt that drugs, by destroying digestion, do far more harm than good.

The employment of climate in the treatment of pulmonary tuberculosis has been gradually increasing in popularity for nearly forty years, and during the last ten years may be said to have taken the profession by storm. The general conclusion has been reached that high altitudes and dry climates are, in the vast majority of cases, the conditions of election, and it has been pretty well decided that marine climates, except in a few peculiar cases, are not advantageous. The result has been that an almost innumerable host of consumptive patients have been sent hundreds of miles from home life to areas in which advantageous climatic conditions undoubtedly exist, and while a very large number of these persons have been materially benefited or cured, it is a regrettable fact that in many instances the disease has been so far advanced, or the circumstances surrounding the patient have been so unfavorable, that good results have not been obtained, the patients suffering from lack of "creature comforts," of good food, and from homesickness, at a time when perhaps they were so ill that all these things are necessary for a healthy and happy existence.

All waves of professional enthusiasm are followed by waves of reaction, and it is interesting to note that a large number of experienced men are now contributing to the literature of tuberculosis articles in which they strongly advocate the so-called home treatment of the disease, using superalimentation and an abundance of fresh air, and little medicine, and reporting as a result of these measures cures which they claim equal or even exceed those obtained by patients who go to places which are said to possess admirable climatic conditions. In their enthusiasm they are even going so far as to assert that home treatment is better than foreign treatment, and in a certain proportion of cases this cannot be denied, when the patient's means are limited and distant travel means actual poverty. The general practitioner, it seems to us, must at the present time recognize that a very large proportion of cases of pulmonary tuberculosis are best treated at home if fresh air and good food and a fair modicum of sunshine are obtainable. But experience and reason confirms us in our belief that other patients more favorably situated as to means and opportunities will do better still if they go to some place where all of the

home comforts will be provided, and where, in addition, the climate is such that the air is dry and the number of hours or days of sunshine is very great. In some instances very advantageous results can be obtained but a few miles from the great cities. In other instances, Arizona, New Mexico, Colorado, or certain places in California will give the best results.

The important point for consideration in this matter is one which we have raised very frequently on other occasions in regard to the choice of drugs in the treatment of various maladies, when we have asserted that no one drug would produce the best results in every case, but that the needs of the patient must be carefully considered if good results were to be obtained. To resort to superalimentation, on the one hand, without the proper quantity of fresh air is bad therapeutics; to assert that home treatment is universally applicable and preferable is bad therapeutics; and to claim that residence in a dry climate and at an altitude is essential in every case is erroneous. But the point of interest is that we have several measures which are of value in the treatment of pulmonary tuberculosis, which in some instances can be combined, and which in others must be separately used. The patient who consults a physician suffering from a pulmonary lesion of this character has a right to expect of him advice as to which measures or which modes shall be followed.

COLD AIR VERSUS COOKED AIR.

Some of our readers have probably been very much interested during the past year or two in reading the reports which have been made by Dr. W. P. Northrup in regard to his method of treating children who are suffering from pneumonia and other infectious diseases. It will be recalled that the wards in which the children are ill are not provided with any artificial heat, and that whenever possible he moves the child and its bed to the roof of the hospital or to the roof of the house, and keeps it there, although the temperature may be far below the freezing point, the child being, of course, adequately covered. He asserts as the result of his clinical experience that by this means the mortality of his cases has been materially diminished, and that the whole progress of the disease is favorably modified. Children who are livid and cyanotic speedily regain a more normal color, and the stupor which frequently seems about to overwhelm them is largely dissipated, if his observations are correct. Naturally an enthusiast, Dr. Northrup has, of course, become an ardent advocate of the so-called cold-air treatment of disease with especial reference to pneumonia, and has gone from place to place singing the praises of this plan of treatment with an ardor which must have carried some degree of conviction, at least, to his more timid colleagues.

There can be no doubt that such an apostle of pure cold air performs a most valuable function in calling the attention of the profession and the laity to the absolute necessity of adequate ventilation, and even if it is believed by some that his enthusiasm carries him to an excess, nevertheless it is to be considered a great gain if he is enabled to force upon us the crying needs of these cases. The question arises, however, whether the benefits which accrue under his method of treatment are dependent so much upon cold air as they are dependent upon pure air. As a matter of fact we believe that pure air is the real consideration, and that its temperature has very little to do with its value unless that temperature has been artificially modified by the methods which are commonly employed in the home or in the hospital. There can be no doubt that in the endeavor to maintain a constant temperature in a room or in a ward it not infrequently happens that too little pure air from out-of-doors gains access to the apartment, any so-called fresh air which enters the room or the ward being delivered to it after it has passed over heated drums or steam pipes, and has therefore been cooked, and perhaps in addition laden with a certain amount of gas and dust which it otherwise would not contain. We are inclined to believe that our

knowledge of the health-giving properties of pure air is as scanty as was our knowledge of the health-giving properties of sunlight before Finsen showed that solar rays possessed special therapeutic properties, and we would not be at all surprised to learn, at some future time, that many of the processes which are resorted to for the artificial heating of rooms deprive the air of some constituent which is valuable and even necessary. A few years ago, when an extraordinary fear of the contamination of milk by bacteria existed, it happened that an immense number of babies became ill because they received milk which had been treated by exposure to high heat with the object of destroying its germ content, the fact not being recognized that this same process of boiling materially diminished the nutritive properties of this fluid. When these facts were finally forced upon us pasteurization became the vogue; and now there are many who believe that pasteurization deprives the milk of certain values, and that it should only be resorted to when there is good reason to believe that the milk is more than usually impure. In other words, the cooking process destroys some antibody or other unknown factor in the milk which is essential to its full value. May it not be possible that the cooking of the air destroys an equally valuable content of which we are as yet in ignorance? We are convinced, after reading several of Dr. Northrup's contributions to this subject and after hearing him speak with enthusiasm concerning his methods, of two things: that neither the coldness nor the purity of the air is the only essential factor in his procedures, but that in addition the danger arises from the heating of the air to such an extent that it is cooked. If this were not true we should have a lower mortality for the out-of-door treatment for pneumonia in the winter than in the summer time, whereas, as a matter of fact, the reverse is correct.

The practical lesson to be learned from Northrup's suggestions is that, on the one hand, the patient should not be exposed to all the rigors of a winter atmosphere, but that it is certainly advisable that the air of the room should not be heated to the temperature of the ordinary living room, but its temperature maintained at 55° or 60°, so that it is not bitterly cold, and, on the other hand, not thoroughly cooked.

MOUTH DISINFECTION.

Several years ago we called attention in the editorial columns of the GAZETTE to the necessity of paying attention to the condition of the mouth prior to the administration of ether or chloroform for the production of surgical anesthesia, it being pointed out that the pulmonary complications which follow the use of these drugs on certain occasions are chiefly due to the inhalation of pathogenic microörganisms which, when in the mouth, are incapable of much harm, but which in the lung create severe disease. When we recollect that the pneumococcus is found in nearly every so-called healthy mouth, and that many other microörganisms are associated with it, it is rather remarkable that pulmonary infections are as rare as they are.

An interesting research to determine the best methods of disinfecting the mouth, particularly in reference to pneumonia, has been published in the *Journal of Infectious Diseases* of October 30, 1906, by Wadsworth. He used a considerable number of substances as mouth-washes, and made culture experiments from the mouth to determine the bactericidal value of his measures. It is interesting to note that in his experience most of the mixtures or substances used at the present time as mouth-washes possess very little if any true disinfectant or germicidal power, whereas normal salt solution or ordinary alkaline solutions are efficient in destroying pneumococci. He also found that none of the so-called commercial solutions, such as listerine, borine, borolyptol, glyco-thymoline, odol, and Seiler's solution, proved efficient when tested upon pneumococci

under conditions supposed to be most favorable for their action, and that even such active disinfectants as formalin, lysol, and hydrogen peroxide failed to act on the pneumococcus in exudates. It is also interesting to note that alcohol alone of all the antiseptics proved efficient when tested on the pneumococci under all conditions. Again, Wadsworth found that the rapid diffusion of alcoholic solutions was greatly accelerated by the addition of glycerin. In other words, cleansing the mouth with a normal salt solution simply cleanses it, but does not destroy the bacteria, whereas washing the mouth with an alcoholic wash containing 30 per cent of alcohol actually produces true disinfection, particularly if to the 30-per-cent solution of alcohol in water a small quantity of glycerin and salt is added. It would seem that this investigation possesses great practical importance, since it enables us not only to prepare patients for operation in such a way that pulmonary complications can be largely avoided, but also because it helps us to prevent the spread of acute infectious diseases, such as pneumonia, from one individual to another, the spread being most frequently induced by small particles of sputum laden with the pneumococcus being expelled in coughing or sneezing, and so finding a way to reach healthy individuals. In hospital wards we are learning that epidemics of croupous pneumonia not infrequently arise after the entrance of a single patient suffering from this disease, and Wadsworth's investigations provide us with a most valuable means of prophylaxis.

TREATMENT OF CANCER.

This topic, always one of fresh interest, partly because the solution of the question of etiology though for years apparently within our grasp still eludes us, mainly because of the increasing prevalence of the disease and the hopelessness of therapeutic measures other than early operation, has been particularly selected by Edmund Owen as the subject of his Bradshaw lecture. There is no part of Owen's teaching more valuable than that embodied in the following remark: "I shall begin my remarks with the absolute statement that in the present state of medical and surgical knowledge and experience the only way in which the cure of a cancer can be obtained is by its prompt and thorough removal by operation. When the surgeon has made up his mind that a growth is malignant, and that it can and ought to be removed, he should lose no time."

Owen strongly deprecates the wasting of precious days or weeks by recourse to electricity, x-rays, or other methods suggested because of the patient's terror of the knife. He notes that many people suffering from cancer delay radical treatment because of the misleading popular scientific articles in the daily papers in response to the wide demand for reading of this kind. These articles are some of them written for advertising purposes; more often they are dictated by an irresponsible optimism unchecked by real knowledge, and suggest for a new treatment prospects of cure which are absolutely unjustified by clinical experience.

In regard to the treatment of mammary cancer Owen states that he cannot believe it necessary to remove the thoracic part of the pectoralis major as a routine practice when the breast shows no attachment to it. In this matter he differs from the majority of modern surgeons.

Cancer of the lip should always be accompanied by opening up of the submaxillary region and taking away the glands, since the latter contain epithelial growths almost as surely as do the labial sore, and if left it is but a question of time when they will involve the neck in malignant ulceration. The simple operation of a wedge from the lip is now happily a thing of the past. If the surgeon intends to excise a wedge-shaped mass the apex must be represented by the tumor, and the sides should spread away to such a degree that when their distant ends are joined by a cross-cut not only all the infected glands

but the lymphatic vessels leading from the cancerous area to them are removed in one piece. Cancer of the tongue quickly infects the lymphatic vessels and glands, but differs from other carcinomata in the fact that it is little inclined to wide metastasis. The vessels of the tongue frequently bifurcate, carrying infection to both sides of the neck. This involves complete removal of the organ even in cases of small, one-sided cancer, and very extensive operations on the neck. Submental, submaxillary, and the upper and lower carotid lymphatics, together with the submaxillary salivary glands, should be taken out with the tongue in one piece. The anterior triangle of the neck must be left as naked as the armpit is left after a complete operation for cancer of the breast. This operation may sometimes have to be divided into two parts, the tongue being first removed and the neck being cleared out later.

Owen alludes to Dawbarn's treatment of cancer by the method of local starvation—*i.e.*, cutting off the blood-supply by ligation of the arteries—and seems inclined to accept this method as serviceable in some cases.

As to statistics, Owen observes that "the true discovery of the nature and cure of cancer will not have to be made manifest by columns of figures and percentage calculations of cures, which, like pancakes on Shrove Tuesday, have to be served up quickly, lest delay should spoil them." Nor does he regard of great value "percentages as applied to human beings when compiled by a surgeon in his evening leisure, to set forth the result of his own treatment of certain sick people. Two patients with a disease called by the same name are not of the same clinical value, nor are twenty, nor two hundred, and the sooner surgery discards the actuarial method in setting forth progress in connection with the treatment of cancer the better."

As to the injection treatment, particularly that advocated by Doyen, Owen has little to say in its favor. He gives a fitting tribute to the value of the work done by the Imperial Cancer Research Laboratory, and roughly sketches the findings in relation to the tracing of cancer in the animal kingdom. It is interesting to note that among the lower vertebrates there is a close association between the incidence of cancer and advancing age. This was observed in cows, mice, horses, dogs, cats, and fish. Moreover, Owen finds comfort in the observation that trout and carp are liable to cancer, thus disproving the infallibility of the teaching to the effect that this disease is one of the evil effects of the indulgence in alcoholic beverages. The mouse, apparently, is the only animal in which cancer can be obtained by grafting. These cancer grafts will not grow continuously in other animals, and indeed will only take root in mice of the same species.

As to the various attempts which have been made to establish the value of cancer cures, the results obtained by radium and by other reputed remedies, which have been forwarded to the laboratory to be tested, have been entirely negative. Owen states that he regrets his inability to call attention to any modern method of treatment which can honestly promise a cure. No certain cure has yet been found, nor so far as known are searchers yet upon the obvious track of one.

GRAFTING OF THE KIDNEYS IN THE BEND OF THE ELBOW BY ARTERIAL AND VENOUS SUTURES.

By those interested in laboratory research it will be borne in mind that not only has the feasibility of arterial and venous end-to-end suture been demonstrated, but it has been shown that certainly in the same species by this means the blood from one individual can be conveyed to the vessels of another without devitalization of its cellular elements. Moreover, it has been experimentally demonstrated in animals that the kidney can be transplanted from its normal position to another part of the body, and by arterial and venous suture its vitality may be preserved for a time at least to such a

degree that it will secrete apparently normal urine. As a further refinement of this experiment Carrel transplanted the kidney of an animal into the neck, uniting the renal artery to the carotid, the renal vein to a branch of the jugular, and the ureter into the esophagus, noting that the animal subsequently passed its urine into its own stomach.

Doubtless stimulated thereto by these extraordinary experiments Jaboulay (quoted from the *New York Medical Journal,* Dec. 22, 1906) in two cases grafted a normal kidney into the bend of the elbow. In the first instance the kidney was taken from a pig. The patient was suffering from advanced Bright's disease, and the operation was to supplement the defect of urinary secretion of organic disease by installing a healthy normal kidney, thus coming to the aid of the natural organs which were affected by an incurable malady. The patient, a woman, was passing only about 500 cubic centimeters of urine daily, which was albuminous and contained but 4 grammes of urea. From a pig killed three hours previously the left kidney was removed and placed in warm salt water. A longitudinal incision was then made in the bend of the left elbow, exposing the median cephalic vein. The kidney was then placed in the wound with the ureter directed toward the inner border of the bend of the elbow. The renal artery was joined to the central termination of the brachial artery, and the renal vein to the central end of the median cephalic vein by a somewhat complicated method. The artery and vein of the patient were passed through short metallic tubes, turned back over the latter, thus everting the intima, and secured in this position by an encircling ligature which fitted into a circular groove on the outer surface of the metallic ferrule. The vessels of the pig's kidney were drawn over the everted human vessels like a hood, completely enveloping them. A circular thread was applied to maintain this relation. After the removal of the Esmarch bandage, the blood was observed to flow through the junction and into the renal artery and the kidney. The latter became swollen, and a drop of blood appeared upon a spot of accidentally produced abrasion on the convexity, inflicted when the kidney was removed from its adipose envelope. The forearm wound was partly sutured and the arm was bandaged in a molded tin splint.

Jaboulay notes that the immediate result of transplanting the kidney was marked diuresis. On the third day the dressing was removed and the kidney found gangrenous on the surface, though its deeper part had contracted adhesions, and this portion of the organ was of a rose color. This gangrenous kidney was removed, the large vessels being filled with clots. In the ureter were a few drops of urine of acid reaction.

In the second case the kidney of a goat was taken. It also became gangrenous, nor in this instance is there a note of improvement of the patient's condition. Jaboulay holds that if renal grafting should prove feasible, the bend of the elbow is peculiarly adapted for the reception of the new organ.

This procedure, while extremely interesting, has, however, not even the basis of laboratory proof to completely justify it, since evidence is wanting as to the possibility of successfully transplanting from one species to another even simpler structures. Moreover, the method of vascular anastomosis he employed is one which greatly favors thrombosis. Under favoring circumstances an attempt to graft a human kidney by direct end-to-end vessel suture with complete burying of the organ would seem justifiable, and the inguinal region would seem a position more favorable to such implantation than the bend of the elbow, though the operation might be somewhat more difficult.

REPORTS ON THERAPEUTIC PROGRESS.

LONGEVITY AND THE MEANS OF ATTAINING IT.

In an interesting paper on this subject BRUNTON in the *Lancet* of November 17, 1906, gives the following advice:

As a raised blood-pressure is itself productive of degenerative changes in the vessels, we have good grounds for believing that if the rise be detected early and counteracted by proper regimen and treatment the vascular changes which it would otherwise produce might be prevented and life very considerably prolonged. The earlier this is done the better, and it is only likely to be done by the sphygmomanometer being used as frequently by the physician as the stethoscope or thermometer is at present, and with an instrument like Potain's modification of von Basch's the pressure can be taken as quickly and as easily as the pulse-rate can be ascertained by the finger. When the tension is found to be above the normal for the age attention should be directed at once to the diet. Butcher's meat and strong soups or sauces containing meat extract should be prohibited, or only allowed in very limited quantity. Where the tension is very high it may be necessary to limit the diet very rigidly indeed, and only allow farinaceous foods with a small proportion of proteids.

The author remembers being called to see a case of cardiac asthma. The patient had an income of about £30,000 a year, and had a medical man whose sole duty it was to look after him. The first question the author asked was whether the urine was free from albumin. He was told that it was, but on getting it found it to be almost like water, to have a very low specific gravity, and on acidulating it with acetic acid and boiling the top he found a faint haze which is so significant of gouty kidney, but which can sometimes only be seen by boiling the top of the test-tube so as to have the lower part for comparison, and viewing the top against a dark background. He at once advised that the patient's diet should be cut down to simple farinaceous food and milk, and upon this diet he soon became quite free from his attacks. While away for a trip on the continent, the author heard of the old man's death, and supposes that some one else had been called in who regarded it as a burning shame that such a rich old man should be put upon a pauper's diet, and yet this was all he could stand, and a more liberal allowance of food would suffice to kill him.

The number of old people who die in workhouses is generally thought to be considerable. The author has been unable to get any account of the numbers above ninety years of age, but in 1901 the proportion of workhouse paupers to 1,000,000 of the total number living at the same age of eighty-five or upwards was 95,631—that is to say, very nearly 1 in 10. A workhouse diet may not be very pleasing to the palate, but it certainly seems an efficient means of prolonging life, and it might certainly be worth while sometimes for others to adopt it whose circumstances would allow of them to indulge in luxury.

Amongst other things which tend to lower the pressure are certainly the use of cholagogues and purgatives, mercurials, such as blue pill or calomel at night once or twice a week, followed by a saline in the morning, as often as may seem necessary. Iodide of potassium does appear to lessen the tension in many cases, especially when given in large doses, such as from 10 to 30 grains three times a day. The most efficient drugs for lowering blood-pressure are the nitrites or nitrates, a class of bodies the physiological action of which was so well investigated by the late Professor Leech, whose death in the prime of life was not only a great loss to scientific medicine, but a personal sorrow to every one who knew him. Nitrite of amyl and nitrite of isobutyl

have a more rapid action than any other of the series, and are useful in cutting short a paroxysm of pain. Nitroglycerin not only has a similar use, but it can be given in divided doses during the day to keep the tension low. Nitroerythrol has a still slower and more prolonged action, and half a grain or more three or four times a day often suffices to keep the tension within moderate limits and completely to prevent attacks of angina, which previously had occurred many times a day.

Latterly the author has very frequently given nitrate of potash with nitrite of soda to reduce the blood-pressure. A dose of 20 grains of nitrate of potash with half a grain to two grains or more of nitrite of soda in a large tumbler of water every morning appears to have a double action in reducing tension, first, by acting directly on the vessels, and secondly, by clearing out products of tissue waste by virtue of its diuretic action. The author described at the meeting of the British Medical Association in Manchester in 1902 the way in which he was led to use this combination, and he was very much interested to find quite recently that the very remedy which he was employing in consequence of pharmacological researches upon its action had been used empirically for the same purpose nearly 450 years ago by Lord Bacon, who placed his reliance chiefly on bloodletting and the use of saltpeter as the best means of attaining long life.

CHLOROFORM: ITS INDICATION AND ADVANTAGES.

THORNTON writes under this caption in the *Southern California Practitioner* for November, 1906.

Ether, chloroform, and the mixtures each have their advocates, and conflicting statements force the reviewer to form his own conclusions, largely from his personal experience and his knowledge of the physiological action of the various anesthetics.

The depressing action of chloroform on the heart and respiration and its tendency to lower blood-pressure will, in the opinion of the author, always make ether the anesthetic of choice in the average operative case.

Also the secondary toxic effects directly due to the anesthetic employed have been shown to be greater in chloroform than ether. This is especially important in operations requiring considerable time.

The ever-present financial consideration, the ease of administration, the pleasantness of the drug, the quickness of its action, and the small quantity required are some of the factors leading most of us to always carry a bottle of chloroform.

Plethoric subjects with full, bounding pulse, whose heart's action calls for a sedative rather than a stimulant, do far better with chloroform than ether.

Atheroma, arteriosclerosis, aneurism, and conditions of weakened vessel walls forbid the stimulating effect of ether. In operations for the relief of cerebral hemorrhage, brain tumors, and in most of the cases of brain surgery, chloroform is the better anesthetic.

As chloroform does not excite an excessive secretion of saliva and mucus its use is preferred in operations about the mouth, larynx, and upper air-passages; especially is this true where the mirror is to be employed.

Chronic diseases of the lungs are said not to contraindicate ether.

Acute inflammations of the lung tissue and bronchi give chloroform the preference.

On account of the toxic effects of chloroform on already diseased hepatic cells, ether is the anesthetic in liver surgery.

In nephritis, opinion is divided between ether and chloroform. Because of the increased blood-pressure and the fact that most of us were taught that ether was an irritant to these cases, chloroform will be chosen.

In administering ether to alcoholics the only effect produced may be a comfortable "jag" for the patient, and chloroform will be substituted.

Among Western and Southern men chloroform will be used in obstetrics. Its effects in these cases have been a source of wonderment. Oftentimes in forceps deliveries we

are compelled to trust its administration to a member of the family or an indifferent nurse, and rare indeed are the accidents following its use. The patient quickly awakens and nausea is almost unknown.

Chloroform will be used in operations requiring but little time, especially with children and the aged.

The ideal anesthetic perhaps is yet to be discovered, but when the author's appendix is removed he asserts he shall insist that ether be employed by the open, that is, by the drop-by-drop, method.

ETHER: ITS INDICATIONS AND ADVANTAGES.

In the *Southern California Practitioner* for November, 1906, McNeil asserts that there are no contraindications for the use of ether. Any patient who can stand the shock of an operation can take it. Those with nerve, lung, heart, liver, and kidney lesions all do better on it than on any other agent now in use, providing it is carefully and properly administered.

Cases of fracture of the skull, intracranial hemorrhage, or concussion require stimulation and very little anesthesia. Here ether, drop by drop, is ideal.

In pulmonary affections ether has been most strenuously objected to, and entirely without cause. If there is any class of patients who need all the available support it is this class, and as ether stimulates the heart and respiration, and at the same time raises the blood-pressure, it must tend to lessen the work thrown on the unimpaired lung tissue. These patients require a greater percentage of oxygen than any other class, and if given there will be little trouble with coughing and excessive secretion of mucus. Pneumonia following operations was formerly laid to ether, but in the light of more recent observations we can no longer blame it. It is probable that too concentrated vapor, chilling, or embolism is responsible for it. The author approves of Grossman's aphorism: "Pulmonary affections following etherization are not the fault of the ether, but of the anesthetizer."

Grave cardiac lesions do not contraindicate etherization for long operations unless the patient has to sit up to breathe, in which case any anesthetic would be hazardous. Those who require stimulation or have an intermitting pulse do better under ether, but great care must be exercised to bring them through the stage of excitement. Hare says he is strongly convinced that when accidents do occur the ether is not to blame, but rather the shock of the operation.

An organic lesion of the kidney is often benefited, at least symptomatically, rather than damaged by a prolonged etherization.

As a class the plethorics are apt to give the etherizer more scares than any other. A little mucus in the mouth, a dusky face and embarrassed respiration, and a loss of corneal reflex are oftentimes signs of great distress to the etherizer, but if he will give plenty of air, keep in mind the amount of ether and the degree of concentration which he has already administered, and the stage of anesthesia which his patient must be in at the time, he will save himself a great deal of anxiety and annoyance to the operator.

A few words now as to the method of administration. As yet no ideal method for the administration of ether has been devised. Until such is the case it probably makes little difference which inhaler is used, providing of course that the anesthetizer is thoroughly familiar with it and the results he wishes to obtain from its use.

Many elaborate and more or less complicated inhalers have been devised from time to time and used with varying degrees of success. The latest to claim attention is the one invented by Gwathmey, which is so constructed that it will automatically mix a desired percentage of the warmed vapors of chloroform or ether with oxygen at the will of the operator. It is very similar to those devised by Braun and by Wahlgemuth, both of which are being used to some extent in the clinics of Germany. While theoretically they seem near perfection, the writer is informed by those familiar with their use that they are far from satisfactory, and even dangerous in the hands of any but an expert. The excellent

results reported are due rather to the skill of the anesthetizer than to the apparatus. When we consider that chloroform as a general anesthetic is dangerous, and that it is a debated question whether it is possible to actually administer a warm ether vapor, we find small justification for the use of these complicated inhalers. The published experiments made upon animals are imperfect and far from convincing.

There is probably no better inhaler for general use than the Bullard, with which we are all familiar. The use of it and others of a similar pattern is generally known as the closed method and requires considerable more skill than it does to use the open method, which is now becoming so popular. This latter method is called "open" because it permits of a free mixture of air with the ether vapor. The mask generally used consists of an Esmarch chloroform inhaler covered with a dozen layers of gauze. It is simple and clean. The ether is sprinkled on this, and the degree of concentration controlled by covering it entirely or in part with a towel. With a little practice it will be found easy to get a mixture of any required strength depending on the needs of the patient.

By covering the mask with a hot, wet towel, the full effect of the closed method can be obtained. Whatever inhaler is used, it should never cover the eyes, as the etherizer should watch them as he does the pulse.

A chloroform-ether or ethyl-chloride-ether sequence can likewise be used with this mask without removing it from the face.

The author believes the open method is the safest and most generally satisfactory which we now possess, and that in some one of its forms it will continue to grow in popularity until it is universally used. If there is any time when we need fresh air and plenty of it, it is when we are under the shock of a surgical procedure. The guiding principle in the use of ether should be to maintain a perfect anesthesia, and yet at the same time reduce the asphyxial factor to a minimum.

THE LIMITATIONS OF FORMALDEHYDE GAS AS A DISINFECTANT.

Bulletin 27 of the Hygienic Laboratory of the Public Health and Marine Hospital Service contains an exhaustive paper on this subject which may be summarized as follows:

Formaldehyde gas, regardless of the method by which it is evolved, is a powerful surface disinfectant under certain conditions. Successful disinfection with it is so dependent upon several factors that its usefulness is more or less limited. The temperature and humidity are of primary importance, while the influence of the winds, character of the room, etc., are of secondary importance.

The effects of temperature seem to be principally upon the state of the formaldehyde after it is liberated—that is, below a certain point it polymerizes. This seems to take place below about 65° F. with the formalin-permanganate, and below about 60° F. with the other methods. Although the germicidal power of formaldehyde is not entirely lost at these temperatures, it is so diminished as to be of very little practical value for disinfection purposes.

The rôle played by the relative humidity in formaldehyde disinfection is more important than that of any other influencing factor. In the absence of moisture, formaldehyde is practically inert as a germicide. The minimum percentage of relative humidity that invariably gives efficient results in disinfecting with formaldehyde cannot be stated exactly, since it varies slightly according to other conditions, such as temperature, wind, the quantity of gas present, the space to be disinfected, etc.

However, it appears from experience that the relative humidity in the air before starting an experiment should not be lower than as follows: (1) For an ordinary well-closed room, 60 per cent; (2) for ordinary railway cars, 65 per cent. With a high temperature, a large quantity of formaldehyde, and a long exposure, efficient results may be obtained with slightly lower percentages of humidity than just stated.

THE TECHNIQUE OF LUMBAR PUNCTURE IN CHILDREN: WITH PARTICULAR REFERENCE TO THE PRESSURE OF THE CEREBROSPINAL FLUID.

HEIMAN contributes to the *New York Medical Journal* of November 17, 1906, a useful paper on this subject. He advises that the operator sit next to the bed, and after sterilization by boiling of the needle and with sterile hands he locates the desired space, in which with his finger-nail he makes an indentation half-way between the two spines—in the median line in children, five to ten millimeters to the right in adults. Firmly grasping the needle and enclosed stilette in the right hand, fixing the guard at a distance from the point of the needle about equal to the distance it is assumed the needle will enter, and with the left hand making firm counterpressure over the next higher spine, the needle is inserted with its point on the nail mark in a direction almost horizontal, upward to an angle of about 10 degrees. Where in adults the lateral insertion is used, the direction is inward and upward. The stilette is now withdrawn, and the conus is inserted into the hilt of the needle, thus connecting the latter with a manometer by means of the tubing. The horizontal arm of the manometer tube is held about three centimeters below the level of the needle until the cerebrospinal fluid appears in the manometer, after which the horizontal arm of the instrument is raised to the level of the needle and the height of the column of fluid in the manometer is read off on the tape, its zero-mark being at the level of the site of puncture. The tube is again lowered, and the desired amount of fluid allowed to escape into sterile tubes. From time to time the pressure should be measured by raising the tube to see whether the normal (from three to five centimeters) has been reached. Quincke warns us of the danger of allowing the pressure to reach a degree much below normal, especially when in certain pathological conditions it is exceedingly high at the outset, and the decrease is very rapid; in first punctures and in cases of doubtful diagnosis special precautions should be taken in this regard. Pfaundler states that when the pressure has reached from two to two and a half centimeters it is not as a rule safe to withdraw any more cerebrospinal fluid.

If the flow is very slow because of low pressure, it may be artificially increased as follows, by influencing one or more of its three components: (1) The hydrostatic pressure, which is represented by the weight of the column of cerebrospinal fluid, can be increased by sitting the patient up. (2) The elastic pressure, or that exerted by the walls of the subarachnoid space and ventricles, can be increased by effecting more forcible spinal flexion. (3) The vascular pressure, or that carried from the heart through the blood-vessels, can be increased by making the patient cough, cry, or breathe deeply, or by compressing the patient's abdomen. It is mainly the vascular element that gives rise to the clinical manifestations of excessive pressure.

In performing lumbar puncture the manometer should be used as a routine, for the reason that the pressure constitutes the best guide in deciding how much fluid is to be withdrawn. To some extent, however, the quantity to be taken off will depend upon the purpose of the puncture, the character of the fluid, and the condition of the patient.

The total quantity of cerebrospinal fluid in the normal adult is said to be from 15 to 60 Cc.; in adults in whom the quantity of cerebrospinal fluid is presumably normal it is uncommon to obtain more than 15 Cc. on lumbar puncture. In serous and tuberculous meningitis, hydrocephalus, tumors of the brain, and uremia, the fluid is clear; in pachymeningitis or brain trauma it may be bloody; in meningitis due to the meningococcus, pneumococcus, or streptococcus, it is cloudy or purulent; in all of these conditions it is increased in quantity and pressure. The author's experience with high pressure and increase in the quantity of cerebrospinal fluid is limited to cases of serous, cerebrospinal, tuberculous, and streptococcus meningitis, and hydrocephalus. In forty lumbar punctures in which

the patients varied in age from three months to twelve years the highest pressure directly after insertion of the needle was 54 centimeters, the lowest 4 centimeters, and the average 26.2 centimeters. In these same cases the average of the various quantities which were of necessity withdrawn to render the pressure normal was 32 Cc., the maximum 60 Cc., and the minimum 5 Cc. In cases of hydrocephalus enormous quantities can be taken off without any ill effects; in one case the author withdrew more than 150 Cc. on three separate occasions. In a small proportion of cases, even with most painstaking technique, bright bloody fluid is obtained, probably owing to puncture of the venous plexus in the anterior wall of the canal; this accident is never harmful to the patient. Dark, decomposed blood indicates a trauma or pachymeningitis.

If fluid does not appear immediately upon withdrawal of the stilette one should not conclude that there is a "dry tap" before waiting a reasonable period and trying the artificial means of increasing pressure, as described before. If these attempts are unsuccessful the puncture should be repeated in another space; but it is seldom justifiable to go further than this. The causes of dry taps are faulty technique, propulsion of the dura before the point of the needle, occlusion of the needle with tissue, fibrin, or pus, abnormally small amount of secretion, or closure of the foramen of Magendie or aqueduct of Sylvius, owing to the pressure of a tumor or to inflammatory conditions.

The usual depth to which the needle has to be inserted in order to obtain fluid is two to four centimeters in children and four to seven centimeters in adults. The depth of the insertion is easily measured by means of a guard on the stilette. Of course this distance varies with the age and build of the patient; in the series of cases mentioned the depth of insertion was least (2 centimeters) in the youngest patient (three months), and greatest (4.6 centimeters) in the oldest patient (twelve years).

In the description of the technique special stress has been laid on the value and importance of the routine use of the manometer tube. It is probable that many of the reported fatalities occurred as a result of too rapid evacuation of the fluid; this can be avoided if the pressure is carefully observed and never allowed to fall much below normal. Most important is this precaution in cases of doubtful diagnosis, especially if the presence of a brain tumor is suspected.

ADRENALIN CHLORIDE IN THE TREATMENT OF RATTLESNAKE-BITE.

To the *Texas Medical News* for November, 1906, FERGUSON contributes a paper in which he advocates the use of adrenalin in snake-bite. His treatment consists of adrenalin chloride, hypodermically, in sufficient doses and often enough to strengthen and sustain the heart until the poison is eliminated; opium in some form for the pain—the better way would be to administer morphine hypodermically in half-grain doses at first, if the patient be an adult. The wound should be incised several times and injected with a strong solution of potassium permanganate for the purpose of eliminating any poison that may be unabsorbed in the tissues contiguous to the wound.

Rattlesnake venom is deep green in color, has a very high specific gravity, and is comparatively slow of absorption, hence the necessity of incision and injection of permanganate. However, when the fangs enter an artery or vein its toxic effect is almost instantaneous. The permanganate solution is chemically incompatible with snake venom, and decomposes all the venom that comes in contact with it in the tissues and blood.

The adrenalin chloride solution (adrenalin chloride 1 part in 1000 parts of physiological normal salt solution, with 0.5 per cent chloretone) should be administered in small doses and frequently repeated until its physiological effect is obtained, after which it should be administered just often enough to maintain its physiological effect. It is the effect of the venom circulating in

the blood that we counteract by giving adrenalin chloride. It can be given in larger doses and repeated oftener in snake-bite, because snake venom neutralizes the action of morphine. Until antivenene or some other potent remedy is produced, our main reliance in treating snake-bites of all kinds lies in the early and careful administration of adrenalin chloride solution in conjunction with other appropriate remedies.

INTESTINAL ANTISEPTICS.

The *Lancet* of November 10, 1906, has this to say in regard to intestinal antiseptics:

The subject of intestinal antiseptics is both complex and important because either purgation or stimulation of natural secretion contributes indirectly to the removal or destruction of microörganisms in addition to any restraining or germicidal power which particular drugs may directly exert. This is continually illustrated by the rapid occurrence of fermentation and fetor in the intestinal contents when the gall-ducts are obstructed, and the speedy disappearance of these features when bile secretion is restored. Again, the beneficial results of effective purgation apart from any question of antiseptics are well displayed in the use of castor oil or a simple enema, where secondary toxemia or infective processes are associated with defective evacuation of the colon. Owing to the extent and active absorbing properties of the digestive tract considerable limitation is placed upon the use of antiseptics in this direction. Many agents of the kind, which have proved effective in other circumstances, could either not be administered in sufficient doses under the peculiar conditions of dilution that obtain, or must be proscribed altogether on account of their poisonous properties. Added to this, the destructive influence of the digestive juices with alternation of acid and alkaline reaction, and the quantity of organic matter present, preclude the effective action of the less stable antiseptics, not to mention the objections that might be raised to such as would interfere with normal digestive processes, promote undue evolution of gas, be liable to give rise to undesirable by-products, or become unduly absorbed in the presence of alimentary substances, as is thymol in connection with fat or alcohol. Bearing these considerations in mind, it is evident that we can only employ for purposes of intestinal antisepsis such agents as possess powerful germicidal properties and are reasonably stable in the presence of organic matter and the digestive juices without exerting any toxic influence on the human system.

If we may draw any inference from the analogy of growing plants, it may be recalled that such are unable to derive any nutriment from earth completely sterilized by heat and will not germinate or grow in it, but, on the other hand, will flourish in decaying vegetable or animal matter, provided it does not contain chemical or living agents which are inimical or in too great proportion. It may, perhaps, be inferred from this analogy, as well as from the normal condition of the intestinal contents as regards microörganisms, that it is in conditions in which they are present in excess, develop morbid propensities of type, or are represented in formidable proportion and of specifically pathogenic nature, that the aid of antiseptics is invoked. Apart from what may be present in the ingesta, there is a plentiful supply of microörganisms of varied and often noxious character in the mouth, the nares, and the pharynx which constantly obtain access to the intestinal tract, yet for the most part no evil consequences resulting. This immunity may fairly be attributed to the protective influence of gastric digestion, a small percentage of hydrochloric acid being sufficient to destroy most of the organisms, though variations in quantity occur in association with general and local departures from health, so that the protection afforded is not absolute. This is proved by the occurrence of tuberculous and typhoid ulceration in the intestines and occasionally even in the stomach itself. Of initial importance in connection with the question of intestinal sepsis, therefore, is the condition of the mouth, which is liable to become the in-

cubator of an excess of microörganisms and those of a baneful nature.

The attention recently directed to pyorrhea alveolaris and other septic states as the possible cause of many complaints, whether of local or general distribution, such as gastric ulcer, appendicitis, colitis, and even pernicious anemia and osteoarthritis, has not yet resulted in any definite advance in knowledge beyond that directed to the remedy of the oral complaints themselves. The intestinal antiseptics of oldest standing and greatest trustworthiness are doubtless mercurial preparations, such as the finely divided metal in blue pill or gray powder. The mercurous and mercuric chlorides and iodides, again, have proved of inestimable value in such bacterial infections as cholera and infantile diarrhea, as well as in many less specifically defined disorders of the alimentary tract, both of an acute and subacute character. Next in order of general use, especially in the more chronic affections, would come the salts of bismuth, which are slower and more prolonged in action and involve greater dosage. Among the recent advances in the use of this series must be noted the strikingly successful treatment of that obstinate complaint, ulcerative colitis, by thrice repeated doses of from one to four drachms of the subnitrate for three or four days. Other preparations of bismuth, such as the salicylate, subgallate, naphthol and phenol bismuth, are particularly adapted, in doses of 30 grains or less, to the treatment of acute forms of gastric and intestinal catarrh, commonly met with in this country associated with an inflammatory state of the mucous membrane. Among the usual antiseptics which, owing to solubility, are specially efficacious for shorter periods and in the upper part of the alimentary tract may be mentioned phenol, sulphocarbolate of sodium, iodic acid, and iodate of calcium, in doses of from one to five grains. All are in fairly constant use in various forms of gastric disturbance, ulcer, or dilatation with fermentation. In febrile conditions and where the septic indications extend beyond the alimentary canal the various salicylic preparations are most serviceable, such as salicin, salol, salacetol, quinine salicylate, and the combination of salacetol with ichthoform given in cachet. Another group of intestinal antiseptics of slight solubility, and consequently maintaining their action throughout the intestine and for a prolonged period, are naphthalene and its derivatives, beta-naphthol and benzo-naphthol, which may be administered in doses of from five to ten grains in cachet or suspended in mucilage, their sustained effect being of especial value in typhoid or tuberculous ulceration.

When it is recalled that secondary infections play a more active part in the progress of these lesions than does the primary infection itself, the value of antiseptic agents, if effective, is obvious. In some at least of the instances in which acetozone has been continuously administered there has been practically no fever of hectic type such as usually characterizes the third and subsequent weeks of an attack of typhoid fever, and absence of ulcerative complications, and an early convalescence; but more extended experience is required before such a result can be regarded as constant.

THE TREATMENT OF GENERAL PARESIS BY MERCURY.

The *New York Medical Journal* of November 17, 1906, reminds us that inasmuch as the belief has become wide-spread that syphilis is one of the most important causes of general paresis, it has got to be more and more popular to make an attempt to delay the progress of the disease by mercurials. The ill success attendant upon the modes instituted in the earlier days of such treatment has been ascribed to insufficient doses, and the period of massive doses was a logical sequel, so that at the present time we find the use of enormous doses of mercury subcutaneously very often carried out, particularly in private practice.

Successful results have been reported, but they have been very few, and there have been not a few neurologists of note who have come to the conclusion that intense mercurialization is not only of little value,

but probably productive of much harm. Their warning voices were made distinctly audible at the recent International Medical Congress, held in Lisbon, where Raymond, Sicard, and Dupré were in accord in condemning the practice. Raymond has come to believe after an extensive trial that this method of treatment is dangerous, inasmuch as he has frequently observed a marked aggravation of all the symptoms following the beginning of the injections, in some instances leading to the extremely speedy death of the patient. He looks upon the good results which have been observed from time to time as having been achieved, not in general paresis, but in syphilitic meningoencephalitis, which is often confounded with the former disease.

Sicard brought out the interesting fact that following the treatment the character of the spinal fluid remained the same, and that the mercurial treatment of paresis was to be used only in the presence of a frank complicating lesion. Dupré saw in the instances of reported improvement either remissions, which in paresis, as is well known, are very frequent, or faulty diagnoses, perhaps even more frequent. The use of mercurials is unjustified and tends, he believes, to add to the initial paresis the results of mercurial intoxication, namely, stomatitis, enterocolitis, tremor, dysarthria, agitation, mental confusion, hallucinations, and subacute cachexia. The paretic, he thinks, does not bear the mercurial treatment as well as the tabetic.

The discussion is not closed by any means, especially in view of the important fact that under the best of circumstances and with the aids of the most refined psychiatric technique the diagnosis of conditions resembling paresis is fraught with inscrutable difficulty. Even the best of psychiatrists recognize their inability to be certain in some ten per cent of the cases at least, and it becomes of vital importance to determine if in our anxiety not to let the small, indistinguishable tenth go untreated we must subject the nine-tenths to a process which may do the patients harm. Until we are in a better position, however, to make our diagnosis more certain, and until it can be shown beyond peradventure that massive doses of mecurials can produce disastrous results, psychiatrists will probably continue to deem it advisable to try to save the few, especially when the many are already doomed.

THE PHYSIOLOGIC STANDARDIZATION OF DRUGS.

The scientific striving for exactness has led to two distinct tendencies in materia medica. The first consists in the substitution of the active principles isolated from a drug for the crude drug itself. This is undoubtedly the correct and scientific method, when the isolated principle really represents the full therapeutic value of the drug; but since this is by no means always the case, the method has its limitations.

The second method consists in the estimation of the strength of a crude or unstable drug by assay processes—*i.e.*, by the determination of the amount of some active constituent contained therein. Perhaps the most notable advance in the new U. S. Pharmacopœia consists in the increased requirements in this respect and in the greatly enlarged list of drugs and preparations for which an assay is directed. With the single exception of diphtheria antitoxin, these assays are all based on chemical methods, in accordance with the instruction of the pharmacopœial convention. It is well known, however, that there are many medicinal substances—including such important articles as digitalis, ergot, strophanthus, suprarenal gland, etc.—for which no satisfactory chemical assay has been elaborated, but the strength of which can be ascertained by appropriate experiments on animals.

These so-called physiological assay processes yield very satisfactory results with many drugs, and are usually not difficult to execute for those trained in the technique of animal experimentation. It is doubtless true that this training is not possessed by the pharmacist. The expense of these tests is also such that it would not be profitable

to apply them on a small scale, but they can be applied in the large manufacturing houses, or by the importers of crude drugs; and, indeed, a very large part of the credit of introducing these methods of standardization is due to the individual enterprise of American firms. Since each firm, however, uses its own methods and standards, a "standardized" product of one maker may be very different from that of another; indeed, in the absence of published standards, we have little more than the word of the manufacturer for his statement that his product has been assayed. To illustrate, we may again refer to the reports of Hunt and of Sollmann and Brown on suprarenal preparations. All the manufacturers claimed a uniform strength—*i.e.*, one part of the alkaloid in 1000 of solution. Two makers, X and Y, emphasize in their advertising that they assay each lot physiologically; if the same standards were used the products should be uniform, but as a matter of fact X is found 50 per cent stronger than Y. A third maker, Z, advertises that all his products are of the highest standard, and subjected to chemical and physiologic assay. Hence his suprarenal solution should be expected to come up to X, or at least Y. In fact, however, it is but a fifth as strong as X. We have no reason to believe that the manufacturer of X is honest and those of Y and Z intentionally dishonest. It is much more likely that they all standardize their products, but that they do so by different standards. And this must necessarily continue until official sanction is given to some single standard, and fairness to the manufacturer as well as to the public would seem to require this. It would be a mistake, we believe, to make these assays compulsory, in view of their impracticability for the retail pharmacist, but there could be no objection to introducing official methods and standards to which such preparations which are simply marked "physiologically assayed" must conform. This would give a definite meaning to a term which is now most indefinite. It would leave the manufacturer free to use other methods, should he so desire, but would compel him to state the fact. It may also be remarked that the warranty clause of the new pure food law would relieve the retail pharmacist from the responsibility for tests which he could not himself execute.

It is to be hoped that the next pharmacopœial convention will appreciate the importance of this subject, and direct the adoption into the United States Pharmacopœia of suitable standards (optional if need be) wherever practical and advisable. It will be a matter of ten years, however, before the next Pharmacopœia becomes official, and the matter is too pressing, at least as regards the suprarenal preparations, to be shelved in the meantime. The adjustment of these standards would require considerable original investigation, which should be started at once.—*Journal of the American Medical Association,* Nov. 17, 1906.

IS SULPHATE OF SODA A TRUE INTESTINAL ANTISEPTIC?

MABERLY, of Cape Colony, tells us in the *Lancet* of November 10, 1906, that the answer which the majority of the medical profession will give to this question is doubtless a very decided negative, and yet the author believes he should submit that there are grounds, clinical and possibly chemical, for thinking that an affirmative one affords a better explanation of the action of the drug under certain conditions. This at any rate is his contention, and whether he is correct or not in that contention there are at least sound reasons for considering that sulphate of soda has an action over and above that of a mere aperient and liver stimulant, one which points strongly in the direction of its being an intestinal antiseptic.

Some years ago Major W. J. Buchanan, I.M.S., published a paper in the *Indian Medical Gazette* (December, 1898) on the treatment of dysentery by means of magnesium sulphate, and later the records of a series of cases successfully treated with sodium sulphate. After reading those papers the author carefully carried out his treatment with one-drachm doses of sodium

sulphate given every six hours in a large number of cases of dysentery and obtained excellent results. In his paper on magnesium sulphate Major Buchanan stated that it was necessary to secure "free gentle purgation," but in the cases which the author treated with sodium sulphate he found that purgation was not necessarily produced, but rather appeared to be undesirable; in fact, in the most successful cases the motions rapidly became less frequent, lost their dysenteric character, and became feculent and of normal consistence in from two to four days, in spite of the continued exhibition of the drug. These results gave rise to the question whether the accepted "gentle purgation" theory was a correct explanation of the action of the drug. With the object of obtaining a solution to the question he commenced giving the drug in infantile diarrhea. In the first cases in which he tried it he found that it produced irritation, and although the character of the stools improved somewhat they did not decrease in frequency. Continued experimental administration, however, taught him that if he reduced the dose of the drug sufficiently to avoid any aperient action the motions in the majority of cases became less frequent, rapidly lost their objectionable odor and character, and became normal without other medicinal treatment. Another marked result was that the vomiting, which is so frequently a troublesome complication in these cases, ceased after one or two doses. (Milk diet was of course avoided as far as possible.)

Since obtaining these results he has gradually relied more and more on sulphate of soda in the treatment of all septic bowel complaints, and has become perfectly convinced that the drug given in proper doses is a true bowel antiseptic, independently of any aperient action, and further, that if we wish to obtain this antiseptic action we must avoid doses which have an aperient action. The doses which the author is in the habit of giving commence with about six grains for a baby under six months old, increasing up to one drachm in the case of the adult, given every six hours in one of the flavored waters, such as fennel. Children over six months old are very tolerant of the drug and seldom exhibit any aperient effects from doses of from 10 to 20 grains. Having arrived at these conclusions with regard to the action of the drug, he extended its use in his practice to typhoid fever, and was very interested to find that the results anticipated were obtained—namely, that the motions where loose and fetid became more normal in appearance and odor, with the natural result that the temperature was lowered and ran a more benign course.

There are cases in which the drug absolutely fails to produce any effect, and for which it is very difficult to find an explanation, unless it be that there is some obscure change in the intestinal mucous membrane which interferes with what may be considered the normal splitting up of the salts. The question now naturally arises, is it possible that a body such as sulphate of soda can have any antiseptic action, and if so to what is it due? There has always been an impression in the mind of the author that possibly the action may be due to the setting free of oxygen during the process of chemical decomposition of the drug in the intestines, and the interesting experiments published by Hay on the action of the saline cathartics in the *Journal of Anatomy and Physiology* in 1883-84 lend at any rate some color to such an argument, or rather enable one to build up a hypothesis which gives some support to that contention. In these experiments Hay showed that sodium sulphate produced copious intestinal secretion according to the amount of the dose and the strength of the solution. He showed further that the sulphate was split up in the intestines; the acid, being more easily absorbed than the base, disappeared partially from the small intestines, to return shortly afterward. In the meantime the base was gradually undergoing absorption and excretion by the kidneys, and never pursued the same peculiar course of absorption and reëxcretion as the acid. That portion of the salt which remained within the bowel unchanged caused the secretion of intestinal mucus and fluid, and consequent purgation, and not the portion absorbed into the blood.

THE TREATMENT OF GASTROSTAXIS, OR OOZING OF BLOOD FROM THE MUCOUS MEMBRANE OF THE STOMACH.

HALE WHITE in the *Lancet* of November 3, 1906, tells us that in his opinion while the hemorrhage is actually in progress and for a short time after it has ceased the patient should be kept quiet in bed, should not be allowed food, but may have some ice to suck. Probably transfusion of normal saline solution is rarely desirable, for it will raise the blood-pressure and so tend to increase the hemorrhage, but it is conceivable that in an extreme case it might be useful. Ergot should not be given in any form, as it will raise the blood-pressure by a general constriction of the arteries. It is doubtful if adrenalin is of value, for it is so diluted by the gastric contents, but still from five to ten minims of a 1-in-1000 solution may be given by the mouth in the hope that its local effect on the gastric vessels may lead to their constriction. It is not absorbed from the gastrointestinal mucous membrane, so that the harm it would do, if injected subcutaneously, by raising the blood-pressure will not be experienced. The author has often given perchloride of iron by the mouth for its local hemostatic effect on the stomach, and sometimes with apparent benefit. Half a drachm of the liquor ferri perchloridi with an equal amount of glycerin forms a concentrated solution which is swallowed easily. The only objection to it is that it appears sometimes to make the patient sick, but if it does not this dose may be repeated frequently. The liquor is better than the tincture because of the alcohol which this contains. Ten grains of calcium chloride may be given three times a day in the hope that it, by increasing the coagulability of the blood, may restrain the bleeding. Under treatment such as this it will nearly always stop.

If the physician is of opinion that the case is one of gastric oozing the patient may, after two, three, or four days from the cessation of the hemorrhage, be fed upon milk in fair quantities, say one and a half pints or two pints in twenty-four hours, small quantities being given every hour, and the liability to the formation of curds being prevented by peptonizing the milk, or better still, by adding two grains of sodium citrate to each ounce of milk. Then if no further bleeding occurs any plain, simple food, such as bread and milk, milk pudding, bread and butter, fish, or minced meat may be ordered, for these patients do well the sooner they take ordinary food. At the same time some preparation of iron, such as the tartrate of dialyzed iron, that does not upset the digestion, may be prescribed. Probably an enema will be needed.

The writer has treated many patients in this way lately, and the rapid improvement has been very striking. Instead of lingering in the hospital for weeks, as these patients used to when they were treated for a long while by rectal feeding or small quantities by the mouth, on the assumption that they had a gastric ulcer, many are, on this altered treatment, quite fit to leave the hospital and return to their work in three weeks at the most. Under the older plan they were treated in the way just mentioned for at least three weeks, and then it took them quite another three to recover from the effects of the starvation treatment. Dr. H. S. French, on looking through the medical reports at Guy's Hospital, states that of late years these cases have been put upon full diet earlier than they were, and that the further back we go in the records the longer the period after the hematemesis before full diet was allowed. He took at random eight cases not under the author's care, in every one of which solid food had been given a few days after the hematemesis had stopped, and they all recovered rapidly. Seven of these were young women; the eighth was a woman aged fifty years. The only objection that can be urged against this treatment is that, as it sometimes is difficult to distinguish these cases from those of genuine gastric ulcer, we may occasionally do harm by feeding a patient suffering from a genuine gastric ulcer too soon.

The author believes that with care these cases of oozing may in many instances be separated from those of genuine gastric ulcer. Then there is a large group of gastric

ulcers, namely, those in which adhesions outside the stomach have quite prevented the risk of perforation; in these no harm can follow giving food three or four days after the bleeding has stopped. In the next place all the patients under discussion came into the hospital for profuse hematemesis. Now it is a remarkable thing that it is quite exceptional to find that a patient who is admitted for a perforated gastric ulcer has recently had severe hematemesis. This opinion is confirmed by an examination of Moynihan's patients, for of twenty-one cases of perforating gastric and duodenal ulcers not a single one had had recent hematemesis, and such a striking circumstance as a profuse hematemesis preceding perforation by a few hours or a few days could hardly have escaped record; the nearest approach to it was the case of a man aged forty years, who vomited blood once, a week before perforation, but this man would hardly have been confused with the cases of gastric oozing, for they are rare in men and at forty years of age, and further, his hematemesis a week before could not have been very severe, for at the time of the perforation of his duodenal ulcer a barrel fell on him, so presumably he was at work. Therefore if a young woman has quite recently brought up a quantity of blood from the stomach, in the first place it is very likely she has not an ulcer at all, and in the next place it is extremely improbable that if she has it is on the verge of perforation.

The author asserts he has never seen or heard of perforation following upon the practice of putting these patients upon solid food early. It is said that the gastric juice is secreted during rectal feeding and that this hinders the healing of an ulcer, but even if there is no ulcer there is a strong reason against the old-fashioned plan of keeping these young women with hematemesis in bed for two or three weeks on rectal feeding, namely, that the most judiciously composed enemata are starvation diet, the patient only absorbing a third or a quarter of the number of calories of food she requires, even when resting in bed, and we cannot expect an ulcer to heal properly in a patient who is starving; indeed, the writer has known an ulcer perforate in a patient who was lying quietly in bed undergoing the routine treatment, so that, even if a genuine ulcer is present, it is probably best for the patient to have plenty of food by the mouth much earlier than is often allowed, for then the general health is maintained at as high a level as possible, and she stands the best chance that her ulcer will heal. During the short time rectal feeding is used dextrose should be the main constituent of the enema, as it is best absorbed by the rectum. That advised by Boyd and Robertson is very good, namely, the yolk of two eggs, 30 grammes of pure dextrose, 0.5 gramme of common salt, with pancreatized milk to make 300 cubic centimeters. But if four of these are given daily only 1200 calories are administered, and of these probably only 500 are absorbed. If for any reason food cannot for a long while be given by the mouth, sterilized olive oil may be injected under the skin night and morning. The author has successfully given half an ounce night and morning for a month to a boy ten years old—he had not a gastric ulcer; this is about 250 calories a day, and perhaps an adult could have more. But we see that with rectal and subcutaneous feeding combined we do not attain half the calories required.

ETHER-AIR ANESTHESIA OR THE DROP METHOD FOR THE ADMINISTRATION OF ETHER.

METZENBAUM in the *Journal of the American Medical Association* of November 17, 1906, advises the following plan for the giving of ether:

The ordinary Esmarch or chloroform mask, covered with six or eight layers of gauze, is held three or four inches above the patient's mouth and nose. The patient is directed to count slowly after the anesthetist, or to breathe in and out, or to blow the vapors away.

The ether contained in the ordinary chloroform bottle with dropper is allowed to drop on the mask somewhat more rapidly than if it were chloroform. The bottle is moved continuously, so that each drop falls

on a different spot on the mask, and is thus thoroughly mixed with air, so that when it is inhaled from the mask it enters the lungs as a partially warmed gas well diluted with air. The mask is lowered gradually; at the same time the drops of ether are increased until a very fine, continuous, steady stream is being spread over the entire mask. The mask is finally lowered until it almost touches the face.

The average patient will be able to count from 70 to 80, some only 40 or 50, while others may count 120 before unconsciousness begins. This will require from two to three minutes. At the end of a period of from five to seven minutes the patient relaxes and becomes sufficiently unconscious so that the final preparations for the operation may be begun. By the time these are completed the patient is in a condition of surgical anesthesia. To accomplish this from two to two and one-half ounces of ether have been administered, and from twelve to fifteen minutes have elapsed.

Once the patient is thoroughly anesthetized he is saturated, so to speak, and a lesser quantity of ether is given to keep him in this condition.

During an operation lasting from one to one and one-half hours from five to seven ounces of ether is administered. Soon after the anesthetic is discontinued the patient comes to, and frequently awakens before leaving the operating-room.

Some points of advantage of this open drop method as compared with the cone method in producing ether anesthesia are: By the open method the patient takes in almost as much fresh air as when awake. The loss of consciousness is due to the anesthetic effect of the ether, without the added partial asphyxiation. Therefore this method is one of purer anesthesia.

By this method the factors of carbonic acid gas poisoning are eliminated and need not be considered. The patient is so gradually introduced to the anesthetic that the change is a transitional one, during which time the mind, brain, heart, lungs, and circulatory apparatus quietly assume the new condition of anesthesia.

There is little, if any, choking, holding of breath, coughing, struggling, rigidity, or vomiting. The patient's eyes are bright, the skin is warm, the peripheral circulation about the face and head is almost a blush. The perspiration is warm.

Considered as a whole, the patient appears more as if asleep than when under any other anesthetic.

The dosage can be governed to a fine point and is within the control of the anesthetist. The patient can be kept just under, and there rarely exists a state of profound anesthesia.

A CASE OF ACTINOMYCOSIS OF THE CHEEK CURED BY IODIDE OF POTASSIUM.

KNOX in the *Lancet* of November 3, 1906, tells us that great difference of opinion exists as to the value of iodide of potassium in the treatment of actinomycosis. The important point is to use the drug at a time when there is a chance of eradicating the disease. Cases in the advanced stages of the disease may be benefited by its use, but the possibility of a cure is an extremely remote one. Whether the simple treatment of opening the abscess and draining it would be sufficient for a cure it is impossible to say, but in this case the fact remains that the patient did not begin to improve until she was thoroughly under the influence of the drug. The action of the iodide in this disease is unknown; possibly by promoting absorption of inflammatory products as they are formed it may check the spread of the disease. So far as known, it can have no specific action on the organism of actinomycosis. Iodides are largely used in the treatment of this disease in veterinary practice, and many cures have resulted.

The evidence in the above case strongly points to infection of the tissues by way of the faulty teeth. The question then arises, How is the parasite conveyed to the patient? The generally accepted theory is that the parasite is carried on straw or grain to the subject in one of many ways, and without doubt cases are on record where this has been so, but there are many cases in which the method of infection remains a mystery. In two other cases which the author has

had under his care the teeth had been faulty, and both patients had suffered from alveolar abscesses and glandular suppurations earlier in their lives. Cases are recorded where the disease has been communicated by direct inoculation from one individual to another. In another case of the author, an extensive skin lesion arose late in the history by the opening of an abscess connected with the pleura, illustrating a feature of the disease which is noteworthy, namely, the tendency of the disease to work from within outward. This tendency was particularly noticeable in the case which forms the subject of this paper. The abscess pointed outward and opened on the skin surface. Contrary to the usual method of treatment in abscesses about the mouth it was encouraged to open outward, as the danger of infection of the alimentary canal was recognized if the discharge found its way into the mouth and stomach.

WINTER UNDERCLOTHING FOR CHILDREN.

The *Archives of Pediatrics* for December, 1906, says of the words winter underclothing or winter "flannels" that they seem synonymous. For so many generations has it been the rule to change to woolen undergarments on, say, November 1, and to take them off on May 1, that any discussion of the topic may seem superfluous if not heretical.

Undoubtedly there are homes and climates in which such a practice is in strict accord with physiology and hygiene, but in our superheated houses and changeable climate this practice is a mistake for the great majority of children. This is evidenced by the increase in the number of colds at the time when the flannels are put on—about the time cold weather begins; also inversely by the comparative freedom from colds of those who wear the same light-weight undergarments the year around.

A few general principles in regard to clothing can be agreed upon. The body should be evenly covered. The clothing should be sufficient in its thickness or number of layers to insure bodily comfort without causing evident perspiration while not exercising. If a child is perspiring noticeably when quiet, either the room is too warm or the child is overheated. Overclothing, by exciting passive perspiration, lowers the bodily resistance and favors chilling by the slightest current of air, warm or cool.

In winter-time children spend the majority of the twenty-four hours indoors, where the temperature is fairly constant, somewhere between 65° and 68° F. Rational management of their clothing would demand that the undergarments be such as are suited to this temperature, which is that of late spring or early fall. Heavy undergarments tend to overheat the child, promote perspiration, make him irritable, and induce him to throw off his outer clothing and perhaps even open a window and sit down while still overheated. All these things encourage deep congestions and colds.

The most satisfactory as well as the reasonable plan, then, is to have only two weights of underclothing for children—the thinnest gauze or some thin-meshed fabric for summer, and a slightly heavier but rather open-woven fabric for the rest of the year. Changes of weather and of outdoor temperature can be met by a change of the outer garments and wraps.

As to the material for underclothing, the weight of opinion is changing to favor absorbent materials, either linen or cotton, instead of wool and silk; for these latter are not absorbent to anything like the same degree. Cotton gauze or a linen towel take up water much more quickly than silk or flannel. A silk handkerchief is useless compared to one of linen. The various forms of meshed underwear have certain advantages over silk and wool garments; they do not overheat the child; they do not promote passive perspiration; they have sufficient air spaces to be good non-conductors, and hence are "warm;" they permit constant free evaporation so that the skin does not remain moist from perspiration to favor chill.

Many children who formerly suffered every winter from repeated "colds" have been entirely cured by substituting air-

meshed garments for woolen underwear; and many whole families of children have abandoned silk or wool for linen or even cotton with the most satisfactory results as regards freedom from catching cold.

Of course, along with proper undergarments there must be rational management of the ventilation and the temperature of the living and sleeping rooms, and care in adapting the outer clothing to the weather.

Overheated rooms, overclothing of children, and dust—these three factors produce most of the so-called "colds" of winter and of the changeable seasons preceding and following it.

ANTITOXIN TREATMENT OF DIPHTHERIA.

The Commissioner of Health of the city of Chicago gives in the Department's Bulletin for October 13 some statistics with regard to the mortality from diphtheria before and after the introduction of the antitoxin treatment. The first case was treated with antitoxin on October 5, 1895, and statistics are given for the ten years 1886 to 1895 and 1896 to 1905. In the first period 10,019 deaths were reported from diphtheria, an average rate of 9.87 per 10,000 of population. During the second period there were 6446 deaths reported from diphtheria, an average rate of 3.94 per 10,000 of population. Had the previous average death-rate from diphtheria obtained during the second period of ten years there would have been 9701 more deaths from diphtheria in the city of Chicago than actually occurred. The Commissioner points out that this is really an understatement of the case. Prior to 1895 more than 90 (92.4) per cent of the deaths attributed to croup were, in fact, caused by diphtheria, as is shown by the figures of the last ten years, during which the difference between croup and diphtheria has been bacteriologically demonstrated. During the last ten years of more accurate diagnosis the death-rate from croup has been 0.30 per 10,000. During the preceding ten years, when diphtheria was so frequently called "croup," the croup rate was 4.12, or 13.7 times greater. The point is that, notwithstanding 92.4 per cent of the deaths formerly attributed to "croup" have been properly charged to diphtheria during the last ten years, the diphtheria death-rate has been decreased by 60 per cent, and the rate from both diphtheria and croup combined has decreased 70.2 per cent.—*British Medical Journal,* Nov. 3, 1906.

A PLEA FOR A MORE RATIONAL THERAPY IN TUBERCULOSIS.

POTTENGER makes this plea in the *Medical Record* of November 10, 1906, stating that since the important researches of Wright and Douglas upon the opsonic power of the blood have shown us that Buchner and Nuttall were right in ascribing an antibacterial action to the serum of the blood, we can see the wisdom of keeping areas which are infected with tubercle bacilli well bathed in serum. The action of the Finsen light is to cause an irritation, with an increased flow of blood to the part. Poultices to certain lupus patches have hastened their cure. Bier's method of treating tuberculous joints, as well as acute inflammations, by passive congestion, can be explained in this same way. In this way we can also explain the action of violet light upon pulmonary tuberculosis. By causing an active hyperemia it is aiding in bathing the parts with serum. Thus, all these measures which tend to divert more blood to the part involved are of value, and should be used in connection with tuberculin, for by so doing we are bathing the diseased areas with a blood which is rich in antibodies.

Another measure which is of value is the giving of raw meat or muscle juice. Experiments of Richet and Hericourt, also of Philip and Galbraith, show definitely that the employment of raw meat and raw meat juice causes a much greater retention of nitrogen than when the meat has been cooked. It is also the belief of these writers that there is something specific against the muscle waste, in the ingestion of the raw muscle.

In order to be most successful in the general therapy of tuberculosis, all distressing symptoms and complications should be

carefully managed. It is rarely necessary to give medicines for cough, night sweats, shortness of breath, loss of appetite, indigestion, or fever of the early or moderately early cases. The careful management of the patient, putting him to rest in the open air, together with the proper hydrotherapeutic measures, will usually relieve all these symptoms very quickly. Organic diseases of the stomach should receive most careful attention, for a good stomach is indispensable. The bowels should also be kept active. In more advanced cases, sometimes these distressing symptoms will have to be relieved by appropriate drugs.

Among the most distressing complications are dry pleurisy, which can be best relieved by strapping, and pleurisy with effusion, which should be removed if it causes embarrassment of the heart or respiration; tuberculous laryngitis, which will yield most readily to tuberculin, local cleanliness, rest, and wet packs; and tuberculosis of the bowel, which will require careful regulation of the diet and such harmless astringents as bismuth in large quantities, or lead and opium in intractable cases. The tuberculous patient is also subject to all other "ills that flesh is heir to," and when present they must be treated carefully.

THE TREATMENT OF ECLAMPSIA.

EVANS writes an important paper on this subject in the *British Medical Journal* of November 3, 1906. He favors the more conservative method of dealing with eclampsia, considering that mutilating operations for effecting delivery should be reserved for the more serious cases in which in spite of treatment the danger to mother or child is very great.

In the severe hepatic form, with profound coma, small, high tension pulse, and scanty, blood-stained urine, delivery should be accomplished as soon as possible, if necessary by surgical means, under deep anesthesia.

In the nephritic form general treatment may be relied upon in the interests of the child up to the thirty-sixth week, the mortality of eclamptic children being very high. In cases occurring after the thirty-sixth week the condition of the child should indicate the method of delivery to be adopted, except in those cases in which the mother's condition rapidly grows worse, as indicated by coma and the condition of the pulse tension.

Immediate operative treatment is indicated in the fulminant cases after the thirty-sixth week in the interests of the child, and in such cases occurring at an earlier period of pregnancy, in the interests of the mother.

One important point in the early treatment of the eclamptic condition is that absolute quiet of the patient must be secured. All manipulation of the patient for any purpose by the physician or nurse should be reduced to the minimum. Deep anesthesia should be secured before any obstetric examination, or to permit the administration of enemas, the passage of the stomach pump, etc.

In the large proportion of cases delivery can be effected by manual dilatation and the early application of forceps, or by version. In cases in which the cervix is long and the internal os not taken up, incision of the cervix is the most satisfactory method of effecting an entrance into the uterus. This can be accomplished according to the method of Bumm, by stripping up the bladder and cutting the cervix in the median line, or by Dührssen's method of cutting both the anterior and posterior lips of the cervix after pushing up the bladder and peritoneum. Statistics of both methods show but little higher mortality than the spontaneous delivery.

The use of the Bossi metallic dilator, though much has been claimed for it, is not to be recommended unless the cervix is at least fairly well taken up.

Hydrostatic dilators play no rôle in the treatment of eclampsia, in the author's opinion, as no artificial dilating force should be employed upon the os or cervix, except under the deepest anesthesia, which should not be prolonged.

Cæsarian section by the abdominal route is but rarely indicated in eclampsia, and then

only to save the child when the mother's condition is hopeless; the mortality of the operation in eclampsia, according to the statistics of Pollock and Boldt, being well over 50 per cent.

In the general treatment of eclampsia there is not a drug used nor a procedure employed on theoretical grounds, or as a result of experience, that has not as many enemies as friends.

Chloral and chloroform seem to be sheet-anchors in the treatment of eclampsia. The former should be used early and in large doses at intervals of four hours. Chloroform should be employed during all manipulations of the patient, but not during the convulsions, as it is then only productive of harm, oxygen inhalations being preferable.

Opium and morphine have been used considerably since revived by Veit; but while they act favorably upon the nervous system and reduce the arterial tension, they certainly tend to interfere with the process of elimination, prolong the coma, and act unfavorably upon the child when employed for any length of time.

Veratrum viride is employed as a specific by many, believing that it promotes elimination by reducing the arterial tension. It certainly reduces the tension, but at too great a cost, as it has been blamed for many cases of heart failure where it has been employed. It must be carefully used in conjunction with camphor or caffeine to get the best results.

Bleeding is advocated by many as relieving the heart and reducing the toxemia. Venesection is of value in plethoric cases, but should not be employed in asthenic cases.

Subcutaneous and intravenous salines are supposed to act favorably, by diluting the toxins and favoring elimination.

Mace and Pierra have demonstrated that injections of normal saline solution result in the volume of urine passed being diminished and becoming more concentrated, resulting in a lower freezing point from the greater molecular concentration. They demonstrate that in eclampsia there is a notable pathological increase in the quantity of sodium chloride in the blood. For these reasons they conclude that salines should not be employed, and have recommended pure water injections and a water diet during the first twenty-four hours.

Subcutaneous and intravenous salines are, according to many authors, contraindicated when the arterial tension is high, the edema marked, and the kidney function much impaired.

Liepmann claims to have demonstrated that the toxin of eclampsia is of an albuminous nature, and that it arises in the placenta, passes over into the maternal organism, and is there fixed, chiefly by the cells of the liver and of the brain. The organs principally affected by the toxin are the brain, liver, and kidneys.

On these grounds Liepmann makes a strong argument for immediate delivery after the first convulsion, preferring manual dilatation and the use of the forceps if possible, and the employment of the Bossi dilator or anterior hysterotomy if the cervix is not taken up. The subsidiary treatment, as he terms it, of eclampsia is directed according to which organ shows the greatest damage—the kidneys, the heart, or the brain.

When the urine is loaded with albumin, casts, and blood Liepmann employs saline transfusion, venesection, and administration of diuretin, digitalis, and camphor in the form of a powder three times daily. When the heart is weak and the pulse is small and irregular he employs caffeine and camphor subcutaneously in large doses. When the brain bears the brunt of the attack, as is manifested by coma, superficial breathing (due to paralysis of the respiratory centers), lung edema, and severe convulsions, he employs artificial respiration almost continuously with intervals of half an hour, in which he recommends stimulation by means of slapping the patient with towels dipped in cold water. The convulsions he treats with large doses of chloral given by the rectum.

Morphine he only uses in the later stages as the patient is recovering, to control the restlessness. He considers artificial respiration is important to overcome the paralysis of the respiratory centers, and that the

cold-water applications, acting reflexly through the vasomotor system on the edema of the lungs, are extremely valuable. He condemns warm packs, as their action tends to concentrate the toxin. In this he is supported by Bumm and others. He expresses the hope that a specific in the form of a serum may yet be forthcoming.

NEURASTHENIA.

In an article on this subject contributed to the *Medical Record* of November 10, 1906, RICHARDSON reminds us of the fact that there is no specific treatment in neurasthenia. Removal of the cause of worry, if possible, increased physical exercise, anything to interest the patient in some form of recreation, attention to the digestion, to the removal of the toxins from the system, and to the building up of the whole system in every possible way are desirable. Drugs, such as the bromides, the coal-tar derivatives, etc., should be used as little as possible on account of their effect upon the assimilation, the circulation, and the blood; the coal-tar preparations are particularly contraindicated on account of their destructive action on the red corpuscles. Bromides depress the heart and the vasomotor system, and should be used with caution. The difficulties of the physician are much increased by the intractability of the patient; he will refuse to leave his business, or perhaps he is unable to do so; he will not take his treatment regularly, will absent himself from the office for a week or two at a time, returning perhaps to scold the physician because he is not better, or perhaps he will seek a new doctor every month; it is no uncommon occurrence to have a patient produce a pocketful of prescriptions from different physicians, upon all of which he will dilate with a curious mixture of astuteness and perverted knowledge, which would be amusing if it were not tedious. The first duty of the physician is to gain the patient's confidence, and by firmness and sympathy hold him to his treatment, a task often of great difficulty, requiring much tact and patience.

THE USE OF OXYGEN IN ASPHYXIA NEONATORUM.

SPIVAK points out in the *Medical Record* of November 10, 1906, the value of oxygen in this state. He says that quite frequently it happens that while the obstetrician is busy in checking a postpartum hemorrhage, or in repairing a lacerated perineum, it falls to the lot of the attending nurse to look after the needs of the neonatus. In cases of asphyxia she even assumes the rôle of a goddess in actually "blowing into his nostrils the breath of life." Under the guidance of the attending physician many a nurse has resuscitated an apparently dead child by the various methods, mechanical, medicinal, etc., known to the modern practitioner.

At the maternity department of St. Luke's Hospital, Denver, in desperate cases of asphyxia neonatorum, a novel method has been adopted at the independent suggestion of two nurses, each unknown to the other. In one case, after having exhausted all his skill, resources, and strength, the attending physician concluded that the child was beyond human aid, and left the hospital in despair. The attending nurse cast her eye on the tank of oxygen which was standing in the corner of the room, and decided to make an experiment of her own, even at the risk of incurring the displeasure of her superior. She turned on a stream of oxygen into the nostrils of the baby, and was overawed to see the infant take its first breath. On the following day the attending physician was amazed to find a live baby in the arms of its mother.

The other nurse, in a similar case, timidly suggested to another attending physician, after he had "thrown up the sponge," to use a few whiffs of oxygen. He did not protest against her audacity to express an opinion in his august presence, but grasped at the opportunity of trying a novel procedure. He was repaid by having saved a human life, and by the gratitude which shone in the eyes of the parturient woman and nurse.

Having obtained the permission of the physicians and nurses to publish the above, and after consulting the recent text-books on obstetrics, the available current literature,

and several prominent obstetricians without finding any record of the use of oxygen in asphyxia neonatorum in this country, the author concluded that the subject deserved to be brought to the attention of the medical profession for the purpose of further research, discussion, and experiment.

ON THE COMPARATIVE THERAPEUTIC VALUE OF ORGANIC AND INORGANIC COMBINATIONS OF PHOSPHORUS.

Editorially the *Scottish Medical and Surgical Journal* for November, 1906, gives an interesting résumé of this subject.

Phosphorus exists in the body in one or other of two forms, inorganic and organic. The most important of the former is calcium phosphate, which forms a large part of the bones. The organic combinations are extremely complex bodies, and the most notable of them is lecithin, which is derived from phosphoric acid and glycerin. This substance, "along with its congeners cephaline and protagon, form essential constituents of the nervous system, and are so immediately concerned in its functional activity as to give rise to the dictum that without phosphorus there can be no thought." In tissues other than nervous we find organic phosphorus compounds in the form of nucleins and nucleoalbumins, especially in the muscles, the thymus and thyroid, the liver, the kidneys, and the spleen.

Seeing that phosphorus in one form or other is present in so many and in such important structures in the body, it is only natural that its therapeutic and dietetic uses have attracted a great deal of attention.

In an interesting paper Dr. Tunnicliffe gives a short résumé of the work of pharmacologists on this subject during the last thirty years.

The story, it must be said, is rather a perplexing and disconcerting one from the point of view of the practitioner, who looks to the pharmacologist for guidance as to the value of the drugs he uses; for the results of experiments have not seldom been quite conflicting.

In former times inorganic phosphates and hypophosphates enjoyed the unanimous confidence of the medical profession, and they were thought to be of great value in a large number of diseases, especially in childhood. Toward the end of the nineteenth century this belief was vigorously refuted. It was said that when they were given by the mouth they could afterward be recovered in undiminished quantities from the feces. Their use was accordingly condemned as altogether futile. On the other hand, lecithin was found by Danilewsky, in 1895, to have an extraordinarily favorable influence upon nutrition, even when given in the most minute doses. A little later the use of glycerophosphates was strongly recommended by Bulow and Pascales on the ground that the phosphorus in lecithin was present in this form. Their observations seemed to be strongly confirmed by those of Robin and by Sanson's experiments. The glycerophosphates came consequently largely into use, especially in France, as nervine tonics and stimulants.

The next class of organic phosphorus compounds to be advocated were those in which the phosphorus is combined with proteids, such as casein. Most observers have found those bodies to be very thoroughly absorbed.

In recent times the decisions of former authorities have been freely disputed by Ehrström, and also by Vosgien and Ceroline, who found that inorganic phosphates were absorbed from the alimentary canal and influenced nutrition quite as much as the glycerophosphates. Keller, too, found that sodium phosphate, when given to young babies, was largely absorbed, and its phosphorus appropriated by the tissues. He regards it as still unsettled whether organic combinations of phosphorus are absorbed any better than its inorganic salts. Rohrmann and his pupils, on the other hand, have continued to maintain the uselessness of inorganic phosphorus combinations.

In order to reach some more definite conclusions as to the best forms of phosphorus to administer, Dr. Tunnicliffe instituted a series of experiments to prove (1) whether in the healthy human child it is possible by increasing the phosphorus of the diet to increase the amount of phosphorus retained

in the body; (2) to compare the value as sources of phosphorus to the body of an inorganic and organic phosphorus compound; and (3) to observe the effect of an inorganic and an organic phosphorus compound upon proteid assimilation.

In Dr. Tunnicliffe's experiments he used as an organic compound the substance known as "sanatogen," which is made up of glycerophosphoric acid and pure casein. For an inorganic compound he gave calcium phosphate. The experiments were made on two young children.

The general conclusions arrived at are given as follows: (1) In the healthy child the addition of an organic phosphorus compound to the diet is followed by an increase in the amount of phosphorus assimilated by and retained in the body. (2) The addition of an organic phosphorus compound to the diet of children increases the amount of the nitrogen of the food assimilated. (3) The addition of calcium phosphate to the food did not increase the amount of phosphorus assimilated or retained by the child, nor did this compound exert any favorable influence upon the assimilation of the nitrogen of the food.

METHYLTHIONINE HYDROCHLORIDE IN INOPERABLE CANCER.

JACOBI contributes to the *Journal of the American Medical Association* of November 10, 1906, his views as to the value of this plan of treatment. He tells us he usually attends a new case of cancer once a month at least. Of these, 20 or 25 per cent are of the inoperable kind. Some that have already been operated on cannot be turned over to the surgeon again. Then will come methylene-blue treatment. The author has seen such cases in fairly great numbers; they certainly count up in the course of fourteen or fifteen years. He has had one woman under observation for eight or nine years. She weighed 91 pounds at first observation; she was jaundiced and is jaundiced yet, and still weighs 91 pounds. Once in six months she reports that she is perfectly well. She is still yellow, still has lumps. Ordinarily, she would have died seven or eight years ago.

Another patient is a business man under observation for six or seven years. At first he weighed 124 pounds, now he weighs 146. At first he was not able to attend to his business. For the last four or five years he has attended steadily to his business day in and day out. A large tumor in the epigastrium has dwindled away to about the size of a walnut. He is apparently well and weighs 25 pounds more. He certainly knows that he is sick, and accordingly he will complain, but he goes about from morning to night.

So the author has had a number of cases, but does not think, however, that he has ever cured a case. He has seen patients die during the treatment, but he has also seen them comparatively well, attending to business, living three, four, seven, and eight years, and perhaps finally submit to their disease.

In the last few months his attention has been directed to the large number of bodies that are favorably influenced by light, that have fluorescent qualities. It appears that methylene blue belongs to that class. He has commenced to expose his methylene-blue patients to the sunlight; whether it will be of any use cannot be determined. He has exposed them in the solarium or in bedrooms, kept them there undressed for hours and hours, as long as their household or business will permit them. It is not impossible, it is even probable, that light will do a great deal more in connection with methylene blue than methylene blue alone. He believes positively that it has rendered him a great deal of good service in at least 120 or 150 cases in the course of the last fifteen years. He has not gone before the profession with his results to any great extent. Only now and then has he mentioned them before societies, but never to such an extent as now. A number of physicians and surgeons in New York have had their attention drawn to the subject and are trying the remedy. It is well tolerated.

He gives the drug in pills, in small doses, 2 grains a day, and runs up slowly to 3, 4, and 6 grains a day. He has heard of bigger doses being given, but has never required larger ones. He thinks the 2 or 4 grains

should be made up in pills with a dose of three-fourths grain of extract of belladonna daily. He knows that the extract of belladonna will relieve the dysuria much better than nutmeg, which has been recommended for that purpose. When we give 6 grains there should be three-fourths of a grain of belladonna given through the day, because adults will not bear belladonna so well as children. They are easily overdosed, they get dry throats in much less time than children with comparatively large doses. It is easy to give it in that way. The author frequently combines it with arsenous acid (arsenic trioxide). The dose would be 1/40, 1/30 up to 1/20 of a grain of arsenous acid three times a day. It can be made into pills with belladonna and methylene blue, and there is no harm, when occasion requires, to give strychnine or extract of nux vomica in order to make up the pill, so the prescription would be 2 to 4 to 6 grains of methylene blue in four doses. It is best given after meals, one at bedtime, with perhaps 1/10 grain of strychnine and 1/10 grain or more of arsenous acid a day, with or without a vegetable purgative, if that be necessary.

Patients should be told at once that the urine will be blue from the very beginning, that it will stain the linen, and that the stains cannot be removed. Therefore the author advises his patients to have an old handkerchief handy and to wipe off the last trace of urine. Apart from that patients will not suffer any inconvenience. In his experience not one in twenty will complain of dysuria. The belladonna appears to act very well. He has recommended it in a number of cases operated on in order to prevent relapses. It is impossible for him to speak with mathematical certainty about the result of that, but he believes that relapses have been prevented. He would recommend it in every case of cancer of the uterus that has been operated on and when relapses must be feared. He believes he has seen less relapses since that has been done. Still, an actual, statistical proof of negative experience cannot be had.

Because he considered the matter of too great importance to be published prematurely, the author has not spoken of it extensively before. He wanted to be perfectly sure about his results. He wanted to have a sufficient number of cases to base his assertions on. He believes he has now waited long enough, and thinks that after fourteen or fifteen years one is entitled to speak of a subject that appears to be of great value. It has done a great deal of good in his practice. It is his belief that he has certainly restored a good many people to their work, and has kept a number of people alive two, three, six, and eight years longer than would have been their share.

SPINAL ANESTHESIA: ITS ADVANTAGES AND DISADVANTAGES.

In the *Edinburgh Medical Journal* for November, 1906, STRUTHERS says that after a perusal of the records it is difficult to agree with those who claim that spinal anesthesia is to be preferred to general anesthesia either in the interests of the patient or the operator. Serious complications attending its use are not infrequent; troublesome sequelæ are common. Its extent and duration cannot by any means known as yet be accurately controlled. Even in the cases in which it succeeds perfectly the great drawback to its use still remains, that the patient is fully conscious during the operation. Were it used only for minor operations such as those suitable for local anesthesia, this would be of little importance, but for major operations it is, to many, an insuperable objection to the use of spinal anesthesia. The mortality in the published records is little, if at all, below that attending the use of chloroform, and greater than that attending the use of ether, when these drugs are carefully administered. The unpleasant sequelæ, although possibly less frequent than those following general anesthesia, are quite as troublesome and distressing to the patient, if not more so. Unless means are discovered to materially lessen its dangers and to regulate more accurately its duration and extent, it seems doubtful whether spinal anesthesia will retain the popularity which it has in some quarters attained.

CINNAMON OIL IN THE TREATMENT OF INFLUENZA.

In the *Lancet* of November 3, 1906, Ross states that for nearly sixteen years he has employed cinnamon in various forms in treating this disease, but for many years now he has always used the oil of Ceylon cinnamon bark. There is another oil of cinnamon on the market, extracted, it is believed, from the leaves of the plant, which though rather cheaper should be avoided, and the oil of cinnamon bark only should be used. We all of us have heard only too often of bad cases of influenza where the unhappy patients have been confined to their beds or their rooms for a fortnight, three weeks, a month, or even longer. Such a long detention on the sick list cannot be a pleasant experience, and the writer asserts he is perfectly convinced that it ought never to occur. He employs these words advisedly. For he altogether declines to believe it can be ascribable only to a singular series of coincidences that now for nearly sixteen years, during which time he has invariably treated influenza with cinnamon, his patients have generally been perfectly fit to return to their avocations, whatever they may have been, within three or four days, and that in no single case has a patient suffering from influenza been on his hands for more than a week.

The treatment for which he suggests a fair trial, and which he invariably adopts, is abundantly simple, and is as follows: Let the influenza patient take 12 drops of cinnamon oil and repeat the dose in an hour; two hours after this second dose let the patient take 10 drops of the oil, and then let him go on taking 10 drops every two hours without intermission till the temperature falls to normal. After the temperature has fallen to normal, or possibly a little under, let the patient take 10 drops of the oil three times a day for a day or two. In every disease, probably, the sooner the patient is placed under treatment the better, and this is preeminently the case in influenza. And if a patient suffering from this disease is systematically treated with cinnamon oil in the manner above described within three or four hours from the onset of the disease it will probably be found that the temperature will have returned to normal within twelve hours; but if the patient is not put under treatment for a couple of days it will probably be at least twenty-four or thirty hours before the temperature becomes normal. After the temperature has fallen to normal the patient should remain in his room for at least twenty-four hours, and if possible should remain indoors for a further period of two or three days. But many cases that had been submitted early to treatment, cases of robust persons under forty years of age, and whose engagements were pressing, the author has permitted to return to their occupations after only twenty-four hours' rest, and so far without any untoward result. But he always advises that patients should remain indoors for two or three days if they possibly can. Especially should they be urged to do so in those cases in which the disease has been allowed to run for a day or two before being submitted to treatment. Each dose of cinnamon oil should be taken in half a wineglass or a wineglass of water to lessen its pungent taste.

It is hardly necessary to add, perhaps, that Ceylon cinnamon bark oil can be easily obtained from any respectable druggist in any town.

DISEASES OF THE KIDNEYS AS INDICATIONS FOR THE INTERRUPTION OF PREGNANCY.

In the *Interstate Medical Journal* for November, 1906, SCHWARZ expresses the belief that it is only when two or more reputable physicians are of the opinion that a pregnant woman is in immediate danger of dying, unless the pregnancy be interrupted, that the induction of her miscarriage becomes justifiable.

To decide in a given case whether or not a woman will die unless she be made to miscarry is a question so hard to answer, and one which involves such grave responsibility, that no individual physician should assume its burden.

The writer believes he has saved a few lives by interrupting pregnancy, but asserts that he positively knows that he has failed

to save others by trying to avoid the induction of a miscarriage.

Regarding his special task, namely, to define the indications for interrupting pregnancy which may arise from diseases of the kidneys, he states that, in twenty-seven years of special practice, kidney diseases have never called for the interruption of pregnancy except shortly before term, when the viability of the fetus was assured.

When speaking of kidney diseases in connection with pregnancy, we must distinguish between disorders that have existed before pregnancy ensued, and that are merely complicated by it, and between disorders of the kidneys which have originated during pregnancy.

Of the first class of cases of which chronic nephritis is the chief exponent, it may be said that as a rule they call for no interruption of pregnancy, especially when the dietetic and other general measures advocated in cases of albuminuria and toxemia of pregnancy are employed. It should be remembered, however, that a great number of these cases (statistics claim over 50 per cent) lead to the death of the fetus, which is not always followed by immediate spontaneous miscarriage, and that the mother must be given the benefit of any doubt about the fetus being alive when the advisability of inducing labor is under discussion.

It should likewise be remembered that in these cases of chronic nephritis the destruction of tissue is more rapid during pregnancy, and that in most cases of retinitis albuminurica in pregnant women detachment of the retina and atrophy of the optic nerve have rather quickly led to lasting blindness.

While these deplorable complications of an incurable disease may not justify the interruption of pregnancy, they certainly make it our duty to prevent conception in women afflicted with the severer forms of chronic kidney disease, and for this purpose it is not sufficient to warn the patient of her increased danger in the event of pregnancy, but we must instruct her to employ means which will enable her to perform her matrimonial duties without the chance of conceiving.

Of the second class of kidney disorders, including the toxic albuminuria of pregnancy with or without casts, it may be said that they usually yield to treatment, or that they can be kept within safe bounds.

When eclampsia or preëclamptic symptoms occur, with or without perverted kidney action, the fetus is almost without exception viable and in as much danger of dying as is the mother, and in these cases it is not a question of inducing labor by imitating the natural processes, but it is a question of rapidly removing the contents of the womb in an effort to save the lives of both mother and child.

In conclusion the author draws attention to the fact that when we speak of sacrifices in connection with the interruption of pregnancy, it is not always the fetus of whom the sacrifice is expected. When death approaches a pregnant woman after a lingering illness while her womb harbors a viable child, we know that during the agony the fetus is likely to die of asphyxia before the mother has expired, and under these circumstances it at times becomes our duty to advocate the induction of labor in an effort to save the life of the child.

SURGICAL TREATMENT OF TUBERCULOUS PERITONITIS.

DOUGLAS (*American Journal of the Medical Sciences,* October, 1906) notes that of 226 cases of peritoneal tuberculosis Borschke failed to find the primary focus in only two cases. The common source of infection in females is the genital tract, especially the tubes. Peritoneal involvement is greatest in extent near the seat of local infection. Infection is often present without producing special symptoms and with a natural tendency to recovery. Schroeder in his medical clinic obtained about 41 per cent of cures. In uncomplicated, subacute, or chronic cases the outlook is distinctly favorable. In very young children with a strong inherited predisposition and severe infection, the outlook is distinctly bad. The symptoms that affect the prognosis are continuous fever, rapid

wasting, persistent diarrhea, and recurring exacerbations. The complications which make prognosis unfavorable are pleurisy, localized suppurations, caseation of the mesenteric glands, and intestinal obstruction. Multiple sites of localization forecast a fatal ending. The subacute and chronic ascitic forms are the most amenable to operative treatment. In only exceptional instances of complications and for the relief of special conditions should operation be undertaken in the fibrous form. The ulcerous form offers an unfavorable outlook, yet even these cases may eventuate in cure. Active intervention is especially indicated when it appears that peritoneal tuberculosis is the only active manifestation. In the acute cases, those of violent onset, the expectant treatment should be preferred to operation.

The treatment of choice is laparotomy and complete removal of the exudate. Drainage is not desirable, nor is irrigation to be advocated. Efforts should not be made to detach adherent viscera further than to free encapsulated fluid or to relieve obstruction. Enlarged caseous mesenteric glands may be enucleated, although this is often a difficult task. It is of prime importance to remove foci of infection. This should invariably be done when the appendix or Fallopian tubes is the source of supply.

Douglas advocates the general conclusion that tuberculous peritonitis can be cured by laparotomy. The unsuccessful cases are those that have advanced disease in other organs. The probable rationale of cure is that the manipulation and exposure cause an afflux of normal serum which is antitoxic. There should be no hesitation in performing repeated operations if there is reaccumulation of fluid, especially if the first operation has been early in the progress of the disease. The immediate operative mortality is but slightly over three per cent.

Cheyne states that in 383 operations 53 per cent of the patients were well two years after operation. Rorsch presents statistics of 358 patients treated operatively, 70 per cent of whom were cured. In 26 cases of tuberculous peritonitis due to local infection Mayo notes that 25 recovered as the result of the operation, although several of these had had previous operation with recurrence. A complication to be greatly feared is the formation of a fecal fistula; it will not occur in the ascitic form unless drainage is employed; it is especially likely to follow in the ulcerous form. These fistulæ are extremely obstinate and difficult to close.

GONORRHEAL ARTHRITIS IN CHILDREN.

GIBNEY (*American Journal of Surgery*, November, 1906) quotes Holt to the effect that in one institution twenty-six cases of arthritis, single and multiple, depended upon the gonococcus developed in a period of eleven years. Kimball published a detailed history of eight of these cases, six terminating fatally, and two dying several weeks later of marasmus after subsidence of the joint disease. Kimball notes that one of the worst cases was in a child of eight years, and acquired at a fashionable school in the city. In children the diagnosis and differentiation is not difficult if the services of a bacteriologist be obtained. The affection is not common in children over four years of age, and it seems evident that a certain number of cases treated in past times for acute infectious arthritis of infancy are attributable to the gonococcus; indeed, Holt states: "A pyemic arthritis in a young infant I believe is much more frequently due to the gonococcus than to the streptococcus, or any other pyogenic organism."

As to the treatment of the different varieties, immobilization is applicable for one class, free incision for another. Milder cases are best treated by close bandages. A rabbit serum has apparently given good results. Of fifty-five cases of gonorrheal arthritis, thirty-four, or 69 per cent, were cured; of the remaining twenty-one cases, twelve improved and nine were unimproved. The antigonococcus serum was probably used on adults. In the case of infection free incision is advisable.

THE SERUM THERAPY OF TETANUS.

JACOBSON and PEASE (*Annals of Surgery,* September, 1906) observe as the result of their study that after tetanus is fully established serum therapy, however administered, promises but little as a curative agent. The intercerebral method, at first received with favor by the profession, has given results that are not particularly encouraging; nor does it commend itself as a means of reaching either the free toxin or that fixed to cells of the nervous system. Moreover, it is not devoid of danger, since one case is recorded which was first reported as cured, but which later died of cerebral abscess. The injection of tetanus antitoxin in the subdural space has been used extensively, but there is neither theoretical nor clinical reason for believing that this has attained any great measure of success. It seems to be a general consensus of opinion that intraneural injections can be of benefit only while tetanus is localized. As a prophylactic measure serum treatment deserves our fullest confidence, but as a therapeutic agent no method has yet been discovered whereby the serum could be administered so as to reach effectively the toxin not free in the blood. The authors append in sufficient detail a large number of cases grouped in accordance with the method of treatment adopted.

OPERATIVE TREATMENT OF IRREDUCIBLE LUXATION OF THE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.

BELL (*British Medical Journal,* Nov. 10, 1906) refers to those cases of injured semilunar cartilages in which reduction is impossible and the patient is left with a slight flexion of the leg, with weakness and more or less pain on attempting to fully extend the limb. In the more severe cases the cartilage, in addition to being displaced, is generally found torn and crumpled in such a way that even direct manipulation cannot restore it to its normal position with any hope of keeping it there and securing a good functional result. Complete removal of the cartilage is the only remedy under such circumstances, and it has been abundantly demonstrated that this is possible without materially disabling the joint. Bell has found it difficult or even impossible to remove the whole cartilage, or even the whole of the torn portion, through the ordinary transverse or vertical incision. He has recently operated on four patients with irreducible luxation of the semilunar cartilage through a free anterior opening of the joint, by transpatellar incision. After removal of the cartilage the patella is sutured. Bell notes that it is very common to find the internal semilunar cartilage when torn curled up in the intercondyloid notch, and he notes that after operation the joint function is perfectly satisfactory, though flexion may be limited.

LEUCOPLASIA AND KRAUROSIS OF THE VULVA.

Leucoplasia, or whitish discoloration, and kraurosis, or atrophy of the mucous membrane, are so commonly associated that no attempt has been made to separate them, but JAYLE (*Presse Médicale,* No. 75, 1906) insists that they are independent and that a great deal of confusion has arisen from the fact that all such cases are called kraurosis in Germany and leucoplasia in France.

Leucoplasia is generally seen on the internal surface of the labia majora, the labia minora, clitoris, and vestibule. The disease affects the epidermis which is adherent, but does not cause atrophy nor retraction. Kraurosis is shown by atrophy of the same region; the labia minora and prepuce may disappear entirely, there may be stenosis of the vagina. It may be whitish, as in the kraurosis of Breisky, who first used this term, or reddish, as in the form described by Lawson Tait. Kraurosis and leucoplasia are frequently associated and may appear together, or either may appear first. Kraurosis shows the following varieties: (1) Leucoplasia, probably the most frequent form: (*a*) simple, varies as the one or other predominates; (*b*) syphilitic, to which some authors believe all cases belong. (2) In-

flammatory, the reddish form above mentioned. (3) Senile, not the usual senile atrophy, but a condition with complete disappearance of the labia minora, etc. (4) Kraurosis, postoperative, following removal of the ovaries, and related to the last. It is very likely that all cases depend on a loss of function of the ovaries. Cancer often develops on a kraurotic lesion. The treatment consists of scrupulous cleanliness and soothing washes. If the follicles are inflamed, they should be cauterized with strong permanganate of potash. If the condition demands more active measures, the entire patch may be excised.

INFECTED WOUNDS—TREATMENT WITH INJECTIONS OF OXYGEN GAS.

Very good results are reported by WOHLGEMUTH (*Therapeutische Monatshefte,* No. 9, 1906), who uses the following technique:

The pure gas is held under a pressure of 100 to 120 atmospheres, and passes through a cannula which is inserted as deep as possible into the wound, and the gas allowed to flow until all the secretion has been removed. A needle is then put in place of the cannula and subcutaneous injections made in the surrounding tissues. The stream must have force enough to cause a marked emphysema, and is kept up in each spot for half a minute. The wound is then dressed with 2- to 3-per-cent peroxide solution. The injections are made every day if necessary, to keep the wound clean. The distention causes some pain, which soon passes off. The method has been used in all sorts of infected wounds with good results. In some cases of purulent peritonitis with drainage the cannula was inserted through the abdominal wall, and a constant stream kept up, the gas bubbling out of the fistula. The results were excellent. The injections are of especial value in old inflammations with dusky discoloration of the tissues. The injection changes the color to bright red, and the stasis improves at once. The oxygen acts by increasing the resistance of the body cells.

PREGNANCY FOLLOWING TRANSPLANTATION OF AN OVARY.

A case more interesting from the standpoint of heredity than from that of surgery is reported by CRAMER (*Münchener medicinische Wochenschrift,* No. 39, 1906), who saw pregnancy follow the intraperitoneal implantation of another woman's ovaries.

Cramer had in his clinic, at the same time, a case of osteomalacia, the best treatment of which is removal of the ovaries, and a case of superinvolution, in which atrophy of the ovaries and premature menopause had followed childbirth. He operated on both women at the same time, removing both ovaries from the case of osteomalacia, and splitting them and sewing them, with the cortex out, one against the denuded posterior surface of the uterus, the other against the similarly split atrophic ovary of the puerperal case. The wounds healed promptly, and two weeks later the first menstruation appeared in the puerperal case. Three months later she became pregnant, but aborted early. (If our ideas of heredity are of any value, the child if it had lived would certainly have been the offspring of the other woman. The idea of giving birth to another woman's child is a very suggestive one.) In another similar case the operation was a complete failure, the ovaries evidently not taking root.

THE RESISTANCE OF THE PLEURA TO INFECTION.

The peritoneum shows a great resistance to infection, and NOETZEL (*Archiv für klinische Chirurgie,* Bd. lxxx, H. 3) has performed a number of experiments to determine why the resistance of the pleura is not equally great. Rabbits were used.

He found that if the bacteria were simply injected through the uninjured chest wall—that is, if there was no pneumothorax—there was no pleurisy, but if a large opening was made in the wall so that pneumothorax resulted, or if air was injected with the bacteria, purulent pleurisy always followed. This difference is due to lessened resistance of the pleura caused by the ab-

normal conditions, perhaps to interference with the lymph circulation. Pneumothorax without infection caused no disturbance. The animals without pneumothorax showed often suppuration of the puncture, but never pleurisy. This shows that the resistance of the pleura is naturally greater than that of the tissues of the chest wall. Another point was the influence of drainage as compared to closing the pleural cavity. He found that all animals with drainage died more rapidly than those without. It is true of men that they seem better after empyema operations if the wound is closed at once, and they do better if the pleura is closed, even if it has to be opened again. The bacteria appear in the blood within five minutes of the time they are injected into the pleural cavity, so their destruction is not due to absorption but to effusion of lymph, which has strong bactericidal powers. In all operations in which an infected pleura is opened, the lung should be sewed to the chest wall and the wound closed, as this gives the system the best chance to get rid of the pneumothorax, which is the worst complication of pleural infection.

CHOLELITHIASIS—PHYSICAL TREATMENT.

In a long article SCHURMAYER (*Therapeutische Monatshefte,* No. 10, 1906) considers in detail all the physical agencies which may be used for this condition, and lays especial stress on their use after operations for the removal of stones.

For the stomach trouble which generally accompanies the condition he uses electricity in the form of intragastric applications and externally as electrical massage, the electrode being attached to the masseur's wrist. In some cases it is necessary to wash out the stomach with a weak solution of nitrate of silver, or if this is irritating, with chloroform water. The constipation is also treated with electricity and massage. The tendency to congestion of the liver is best combated by breathing exercises, which should never be neglected in the treatment of these conditions. The patient is shown how to breathe so that the diaphragm will make the greatest excursion possible. The movement imparted to the liver in this way has more influence on its circulation than any other method of treatment. Other methods of physical therapeutics are taken up in great detail.

INTERNAL HEMORRHAGE—TREATMENT BY MILK ENEMAS.

Remarkable results are reported by SOLT (*Therapeutische Monatshefte,* No. 10, 1906) from the use of enemas of milk, warmed to body temperature, and best introduced by a piston syringe; the intermittent flow gives better results than a constant stream from a fountain syringe. He has stopped a large number of hemorrhages from the uterus, bladder, stomach, lungs, and in fact from every part of the body. In some cases more approved hemostatics had been used for hours without result, and the milk was immediately successful. At least a quart should be given at once, with nothing added but a little salt to make it absorb more rapidly. The enema should be repeated in an hour, even if there is no return of the hemorrhage. The usual local measures are employed at the same time. The method of its action is not certain, but milk contains a large number of substances which are recommended as hemostatics—iron, phosphoric acid, sulphuric and citric acids, but above all, lime salts. The enzymes and leucocytes also tend to cause an increase in the fibrin ferment. The milk loses its hemostatic power if it is given by the stomach.

SURGERY OF THE BLOOD-VESSELS.

The operations considered by LEJARS (*Presse Médicale,* No. 79, 1906) are ligation, suture, and anastomosis.

The only veins the ligation of which is almost certainly fatal are the portal and mesenteric, the superior vena cava, the inferior vena cava above the renal vessels, and the internal jugular near to the skull. If it is necessary to ligate the last vessel, it should be tied as low as possible, as this

gives the best chances for an anastomotic circulation. Single branches of the portal vein may be tied without great danger. The suture of wounds in the walls of veins is entirely dependent for its success on absolute asepsis, as the least infection will cause thrombosis, and block up the vessel as effectively as a ligature. The results of this operation have been very good in recent years, and it may soon be the operation of choice in all wounds of large veins. Even the vena cava and the lateral and transverse sinuses of the brain have been sutured successfully. The suture of transverse wounds of more than half the circumference of the vein leads to stricture, which prevents the vessel being of use, so such wounds are best treated by ligation. End-to-end anastomosis of vessels cut entirely across has been performed several times, but in man its only application at the present time is to recent traumatic arteriovenous aneurisms, in which the artery and vein may both, or either, be cut across above and below the aneurism, and the ends joined. This operation has been successful several times. The insertion of the portal vein into the vena cava, to relieve the congestion of hepatic cirrhosis, fails on account of the fatal effect of the intestinal poisons on the system. In some cases an attempt has been made to restore the circulation in limbs the subjects of arteriosclerosis with gangrene by suturing the main artery of the limb end to end into the vein, but all such attempts have failed on account of the resistance of the valves in the veins.

The ligature of veins to prevent escape of emboli in cases of thrombosis does not seem to have been very often performed, but ligation of the jugular and of the brain sinuses to prevent pyemia in cases of middle-ear disease is often done in France. Ligation of the uterine veins in cases of puerperal sepsis is not so well established, and as yet has been successful only in chronic cases with beginning chills. The indications are not very precise.

Suture is best done with a round needle and silk. If the wound is small, continuous; if large, in several parts. If the entire circumference is sutured, it is wise to first put three sutures at equal distances, and by drawing on these convert the vessel into a triangle. The sutures are passed entirely through the wall, about 1/12 inch from the edge of the wound.

In the discussion which followed most favored the use of ligatures for wounds, and Delaunay reported a case in which he ligated the vena cava above the renal vessels and the patient recovered.

POSTOPERATIVE OBSTRUCTION, DUE TO TRENDELENBURG POSTURE.

After reviewing the varieties of obstruction, and commenting on the frequency after ovariotomy for cysts, DAVID (*Tribune Médicale*, No. 36, 1906) states that the condition is often due to torsion of the bowel from faulty position, and that this is due to the free motion left to the bowel after reduction of intra-abdominal pressure. The elevated pelvis has the same effect in reducing pressure, and the bowels do not return to their normal place when the body is put in a horizontal position. Surgeons should therefore be very careful to bring the body back into this position and to see that the intestines are in proper position before closing the abdomen.

FRACTURES—OPERATIVE TREATMENT.

After detailing a large number of cases, RANZI (*Archiv für klinische Chirurgie*, Bd. lxxx, H. 4) draws the following conclusions:

Operation should be performed on fractures of the shaft of long bones only when reduction and retention are impossible, as when muscle intrudes between the broken ends. If union is delayed, however, it is better to operate soon, as delayed union induces atrophic changes in the muscles. If there is partial union in bad position, it is best to operate at once, as nothing is to be hoped for from other methods, and the operation is the more difficult the longer it is delayed. Primary operation is indicated in

fractures of the upper end of the humerus with dislocation of the shoulder, in most breaks involving the joint surface, and in fractures of the ends of long bones, in which a muscle attachment is broken off and cannot be brought into absolute apposition. This includes fracture of the olecranon, patella, os calcis, tuberosity of the tibia, condyles of the humerus, and others of the same kind.

DISEASES OF THE EYELIDS—TREATMENT BY SUCTION HYPEREMIA.

Styes and furuncles of the lids are treated by HOPPE (*Münchener medicinische Wochenschrift,* No. 40, 1906) with suction applied by means of a rubber ball and glass cups. The cup is as small as will include all the diseased area. The negative pressure is that made by a round ball 2 inches in diameter, or 30 mm. of mercury. The cup is left in position not more than one-half hour. If this pressure or time is exceeded, there may be hemorrhages. The results were prompt and favorable in all the cases in which the method was used.

CARCINOMA—TREATMENT BY ANESTHESIA.

Believing that the growth of tumors is dependent upon increased blood-supply, and that this is due to irritation of a reflex nature, SPIESS (*Münchener medicinische Wochenschrift,* No. 40, 1906) attempted to prevent the reflex irritation (and thereby the increased blood-supply and growth) by injection of local anesthetics into the tumors.

The first work was done on artificial, or rather transplanted, tumors in mice, and in all cases the injected animals did better than the controls. The most effective anesthetic was a modification of novocain, which is not on the market, but as this is very toxic it was difficult to give effective doses without poisoning the mice. Several tumors were cured entirely, although controls with the same tumor died rapidly. The effects were marked on slow-growing tumors only, perhaps on account of the small doses. The method was tried in a very few cases in man, but the results so far are not encouraging. The method is, however, to be thoroughly tested in the Institute for Cancer Research.

TUBERCULAR ADENITIS—TREATMENT BY X-RAYS.

The results of twelve cases are reported by BARJON (*Lyon Médicale,* No. 41, 1906), who found the principal effect on the general infiltration which so often accompanies scrofula, uniting the lymph glands in a solid mass. The glands become separated soon after beginning the applications, and later disappear. If there is any tendency to softening the rays hasten this, and the abscess soon requires to be opened. The rays continue to have a good effect on the suppurating tissues. No bad effects or tendency to cause metastasis were noted.

MAXILLARY SINUS EMPYEMA IN THE NEW-BORN.

This disease is not common among infants, according to WEISSMANN and FIOCRE (*Annales des Maladies de l'Oreille, du Larynx, du Nez et du Pharynx,* No. 9, 1906), who state that it is first shown by a swelling and redness of the suborbital region or the entire side of the face. Inside the mouth there is swelling of the gum or the roof of the mouth. Later there is exophthalmos and a fistula inside the mouth or on the cheek, water injected into which flows out of the nose, and in which a probe feels dead bone. Secretion may be excessive or slight, and may continue after cure.

Treatment must be operative, lavage being of no use. The sinus may be opened from the nose, mouth, or cheek, but in infants the first gives too little room, and the second involves the loss of the roots of all the permanent teeth, so only the external operation should be used in infants. If there is a fistula the incision should include it, otherwise it should extend from the root of the ascending ramus of the maxilla along the inner third of the floor of the orbit. The bony wall below the orbit is raised, the flap

being inside and above the infraorbital foramen, and the sinus then freely opened and all dead bone removed. When the sinus is clean a large counter-opening is made into the nasal cavity, and the external wound closed without drainage.

UTERINE CANCER AND PREGNANCY.

Vaginal hysterectomy or Cæsarian section is recommended by SCHEIB (*Prager medicinische Wochenschrift,* No. 39, 1906), who has used the method four times.

The womb should be removed as soon as the condition is discovered, not waiting until the child is viable. During pregnancy the operation of hysterectomy per vaginam is easier than at other times. In these cases there is always danger of infecting the peritoneum if the abdominal route is followed. It is probably easier to make a complete operation through the vagina than through the abdomen. The vaginal route is preferred by the author whenever it is possible.

CARCINOMA—EXPERIMENTAL PRODUCTION.

On the basis of experimental work, FISCHER (*Münchener medicinische Wochenschrift,* No. 42, 1906) decided that the growth of carcinomata into the connective tissues was due to the presence in the latter of a sort of chemotactic substance which exerted an attraction on the epithelial cells.

He tried by injection of various substances into the tissue below the epidermis to cause this to extend downward, and found that many irritants had such an effect. The effect, however, is not due to the irritation or to inflammation of the connective tissue, as some of the strongest irritants do not have any such effect. Olive oil injected immediately under the skin causes a thickening of this, but no growth resembling carcinoma. When, however, a solution of Soudan III or Scarlet R. in olive oil is injected under the skin, a growth of the epithelium results, which resembles squamous epithelioma in all respects, even to the formation of pearly bodies. The growth continues as long as there is any oil left in the tissues. No tumor has been produced which continued to grow after the coloring matter had disappeared, nor has a tumor been produced elsewhere than in the skin. The author discusses the theory of tumor formation at great length, deciding that carcinoma develops from a misplaced bit of epithelial tissue, attracted to growth by special chemotactic agents, which he terms "attraxines."

THE INDUCTION OF LABOR—BEST METHOD IN PRIVATE PRACTICE.

Of the various methods in use, some are too slow and others dangerous, so POLANO (*Münchener medicinische Wochenschrift,* No. 38, 1906) considers that only introduction of bougies, rupture of the fetal membranes, and metreurysis are worthy of consideration.

The introduction of bougies has the great disadvantage of often causing injury of the placenta. It is uncertain and slow, and brings more danger of infection than the other methods. The rupture of the membranes is the most conservative method, but may not act, and if it does is often very slow, three or four days intervening between it and labor. On the whole the last method, consisting in the introduction of a rubber bag in front of the fetus and its expansion with air, is the best, as it is not dangerous to either mother or child, is rapid, and easily executed. After strict cleansing of the patient and douching with lysol or other antiseptic, the cervix is dilated with metal dilators to the size of the finger. A metreurynter of 600 Cc. capacity is introduced, rolled up like a cigar, and at once inflated with a measured amount of fluid to its full capacity. When the cervix is sufficiently dilated, which may occur before the balloon is expelled, the woman is anesthetized and the child extracted, preferably by version. It is not wise to wait for natural expulsion, as this may not occur, and the cervix may contract again. The rapid changes in pressure to which the

fetus is subjected, if it is not extracted at once, may affect its heart action or even prove fatal to it. For these reasons the child should be extracted as soon as possible.

SYPHILITIC PARALYSIS OF THE FACIAL AND AUDITORY NERVES.

After a long study of this subject LANNOIS (*Annales des Maladies de l'Oreille, du Larynx, du Nez et du Pharynx,* No. 9, 1906) concludes as follows: (1) Syphilis may affect either the facial or auditory nerves separately, or both at the same time. (2) These paralyses may occur in any stage of the disease, even very early. (3) They are usually due to toxins, but may be caused by tertiary lesions. (4) The facial palsy usually passes away quickly, while the deafness is ordinarily permanent.

COMPOUND DISLOCATION OF THE WRIST.

The treatment of dislocations of the wrist in which the end of the bone protrudes is taken up by COUTEAUD (*Revue de Chirurgie,* No. 8, 1906), who states that the bones should be replaced without resection if this is possible. The least harmful resection is that of carpal bones adhering to the upper fragment, if the separation is intracarpal; otherwise resection is very likely to leave a stiff joint. Any carpal bones entirely free should be resected. Amputation should never be primary. Immobilization and antiseptic lavages must be continued a long time.

ACTINOMYCOSIS IN PREGNANCY.

A large number of cases have been collected by THEVENOT (*Revue de Chirurgie,* No. 9, 1906) in which actinomycosis which had remained latent throughout pregnancy suddenly took on a very rapid development as soon as this was ended. The curative action of iodine on the disease and the frequent disturbance of iodine metabolism in pregnancy and the puerperium may have something to do with this relation.

CARCINOMA—IS THERE AN IMMUNITY?

Why is autoinoculation of cancer in new localities of cancerous individuals so rare? asks STICKER (*Münchener medicinische Wochenschrift,* No. 39, 1906). When implantation of cancer in the lower animals is so easy, why do we so rarely see cancer of one lip infect the other, or epithelioma of the skin affect other regions?

He found on experiment that whereas it was easy to implant a cancer in a healthy mouse, it was impossible to implant one in a mouse already the subject of a similar tumor. This is not due to an antitoxin of any sort, as the protection ceases the instant the tumor is removed—that is, too soon for an antitoxin to disappear from the blood. Two or more tumors of the same sort may, however, be implanted at the same time, and all grow. Partial removal of an existing tumor does not remove the protection. It is also noteworthy that this protection ceases in the immediate vicinity of the tumor, and thus does not prevent its growth. The increased liability to implantation after removal of the entire tumor explains the frequency of carcinosis following radical operations, and emphasizes the care which we must take not to let the tumor come in contact with other parts during its removal, and especially the danger of causing general carcinosis of the peritoneum in removing cancers of the abdomen.

BENIGN GENITAL TUMORS—TREATMENT DURING PREGNANCY.

The treatment of ovarian cysts and of myoma is taken up by FRANQUE (*Prager medicinische Wochenschrift,* No. 40, 1906), who states that there is more danger of pregnancy being interrupted by the presence of an ovarian tumor than by an operation for its removal.

At least 17 per cent of the cases with cysts abort, and not more than 16 per cent of those operated on during pregnancy. The danger to the mother if the cyst is not removed is very great, torsion of the stalk being fairly common. The author reports

a number of cases in which the operation was successful, in spite of unfavorable circumstances. He believes that ovarian cysts should be removed during pregnancy whenever such are found, whether they have yet given rise to disturbance or not. The treatment of myomata should, on the contrary, be left until after the end of pregnancy, whenever possible. The only symptom which ordinarily demands operation is pain so severe as to suggest peritonitis, which indicates, as a rule, beginning necrosis of the tumor. This if neglected is likely to lead to fatal peritonitis. The proper treatment is myomectomy if this is possible, otherwise hysterectomy. Abortion should under no circumstances be performed, as the danger of infection is excessive. In most cases it is best not to operate until after labor.

TUBERCULAR ARTHRITIS — TECHNIQUE OF INTRA-ARTICULAR INJECTIONS.

The details of this method of treatment are given at length by CALOT (*Revue de Thérapeutique,* No. 17, 1906), who prefers the method to any other.

The method, which is only applicable to joints in which there is no secondary infection, consists in the injection of antiseptic liquids directly into the joint cavity. There is no danger of fistula resulting if no two injections are given at the same point and no needle larger than one-twelfth of an inch in diameter is used, and the needle is not left in too long. Great care must be used in regard to antisepsis; the skin must be thoroughly cleansed and the puncture dressed with as much care as a laparotomy wound. Two solutions are used, the first being employed except when it is desired to cause breaking down of exuberant tissue; it is a solution of 2 per cent of creosote and 5 per cent of iodoform in equal parts of olive oil and ether. The second, which is used to soften fungous masses, is made by heating together 2 parts of camphor with 1 of beta-naphthol until it melts and mixes, and adding 15 to 20 parts of glycerin. This mixture must be shaken well before using. These liquids are not irritant and there is no pain following the injections. There may be some malaise and fever, and if this rises to more than 102° the amount should be reduced. The only apparatus required is a syringe holding 15 Cc. and an aspirating syringe holding 10 Cc. If a larger aspirator than this is used there is some danger of causing hemorrhage into the synovia. The aspirating needle should have a lumen of 1/16 inch, and the injection needle is the smallest through which the fluids will flow. The syringe can be fitted to the aspirating needle by inserting the small needle into the larger one. In simple cases with neither effusion nor fungosities, the small needle is inserted and 5 Cc. of the first liquid injected. Dress the wound and repeat in six days. If there is bleeding through the needle, withdraw it and insert in another place, and if this bleeds also wait until the next day and try again. This treatment is repeated ten times and the joint immobilized for several weeks.

The joints with effusion are treated in the same manner, except that the aspirating needle is first inserted and the fluid drawn off by attaching the syringe. If there is more than 10 Cc. it must be repeated as often as necessary.

Hemorrhage is to be avoided, and therefore if the fluid withdrawn becomes blood-tinged, stop the aspiration and give the injection at once. For the same reason the joint should never be manipulated to force the fluid out. When no more fluid flows a few drops of water is injected to show that the needle is not stopped, and if no more flows the small needle is inserted in the large one and 10 Cc. injected as above. After dressing the puncture a bandage is applied. The injection is repeated in six days, but if the fluid collects before this time the joint may be aspirated, but no liquid injected. After twelve injections have been given the joint is very carefully dressed with a pressure bandage, and left for fifteen to twenty days. Great care must be taken to press on every part of the synovial cavity and leave no stagnant points. The dressing

is then renewed and the joint aspirated if necessary, but no fluid injected. The dressing is renewed and again left in place the same time, then again renewed, and so on for three months. This always cures if the method is properly carried out. If at any time the skin becomes sore in one place and threatens to give way, never open the joint. However bad the skin looks, it may always be saved by aspirating the joint at another place, and applying a firm compress. The joint must be carefully watched and aspirated as soon as the liquid collects, several times a day if necessary. Never incise a tubercular joint.

The treatment of joints full of granulations is conducted along the same lines if it is desired to sclerose these, but if they are so exuberant that it is necessary to soften them, the second liquid is used: 2 to 5 Cc. of this is injected every day until fluid collects in the joint, when it is treated as before. If after each injection a large effusion appears, reduce the amount injected to half. If the cavity is obliterated in part the first formula is generally best. If there is a fistula, the injections may be given through it, at least at first.

SEPARATION OF THE LOWER EPIPHYSIS OF THE RADIUS.

The interest of this affection, according to MARCILLE (*Tribune Médicale,* No. 37, 1906), is the danger of interference with the growth of the radius and consequent oblique deformity of the wrist.

The lesion is more common than was believed before the time of *x*-rays, and occurs in persons of twelve to fifteen years. It is almost always due to overextension of the wrist, and the epiphysis is carried backward. The signs are like those of fracture of the radius, but the protrusion of the dorsum of the wrist is less marked and the anterior depression more. The point of greatest tenderness is farther down. There may be very little displacement, and the deformity shows no tendency to recur after reduction, which is easily performed. Union is constant in about the same time as in fracture of the radius, the treatment being the same. In some cases in which the bone has not yet reached its full length, it may stop growing. As this would lead to marked angular deformity if the ulna continued to grow, it is best in such cases to remove the lower end of the ulna, thus preventing its further growth and keeping the arm straight.

HIP DISEASE—TREATMENT OF CONTRACTURE OF THE KNEE.

In neglected cases of tubercular coxitis we sometimes see the knee bent at a right angle, or even acute, when the hip is extended. LAUENSTEIN (*Centralblatt für Chirurgie,* No. 40, 1906) states that if a too forcible attempt to correct the deformity is made, the leg, acting as a lever, may pry off the lower epiphysis of the femur. If the contracture is firm, no attempt should be made to overcome it by force until the hip has been in extension for some time, when it will be found that correction is comparatively easy.

TRANSPLANTATION OF THE THYROID INTO THE SPLEEN.

Believing that the failures in transplanting the thyroid gland were due to the poor circulation of the surrounding tissues rather than to lack of vitality in the gland, PAYR (*Archiv für klinische Chirurgie,* lxxx, 3) sought to discover a tissue whose circulation was especially free, and finally selected the spleen, finding that pieces of the thyroid inserted in a pocket in this organ retained their vitality.

The blood circulation of the spleen is peculiar in regard to the presence of large blood spaces outside the ordinary vessels. Hemorrhage from the spleen is not to be feared if the incision is made along its border. The thyroid gland is sliced almost in two with a sharp knife and the halves turned inside out and sewed together, cortex in. A pocket of the same size is then made in the border of the exposed spleen, with a knife which is neither sharp nor dull, about like a brain autopsy knife. Into this pocket the gland is slipped and held by sutures, some of which pass through the gland;

others close the capsule. There is no bleeding, either at the time or later, if the pocket fits the gland. The wound should be covered with omentum. Autopsies showed that the blood-supply of the spleen was increased after implantation, and that the thyroid was well preserved and secreting colloid matter which was being carried off in the blood. Forty-eight dogs and cats were thyroidectomized and the gland implanted in the spleen. None of these died of lack of thyroid secretion, although some died early, from poor housing and care after the operation. A few were kept alive about a year and remained in good health. The gland was active, and it does not seem likely that it would have died later.

On the basis of these results Payr performed the same operation on a child six years old, the thyroid tissue being taken from the child's mother, whose thyroid was somewhat enlarged. The pyramidal process of the mother's thyroid was removed and immediately implanted in the child's spleen. The result has been perfectly satisfactory so far, only a year having elapsed since the operation, during which time it has made more progress than in the previous three while under full thyroid medication. No thyroid in any form has been administered since the operation.

LUMBAR ANESTHESIA—DISCUSSION.

The question of anesthesia by intradural injections is discussed by the Obstetrical Society of Leipzig (*Centralblatt für Chirurgie,* No. 41, 1906). Most of the speakers praised it, in spite of certain bad effects, which are not often seen. The danger lies in the paralysis of the respiratory and cardiac nerves. In four cases it was necessary to use artificial respiration, and in several others there was temporary loss of power in the muscles of the eye. If the anesthetic extends too high there may be great danger. On the whole the reports are favorable, as there are none of the disagreeable after-effects of ether. Vomiting occurred in some instances, and in a few there was no anesthesia and the operation had to be finished with ether.

EXPERIMENTAL INTERSTITIAL NEPHRITIS.

The hitherto impossible problem of producing this lesion experimentally has been solved by RAUTENBERG (*Mittheilung aus der Grenzgebiete,* xvi, 3), who ligated one ureter close to the bladder, and saw develop, in rabbits, a typical interstitial nephritis, with sclerotic changes in the arteries and hypertrophy of the left heart. The ligature was left in position from two to six weeks, and the ureter then implanted in the bladder. Similar operations on cats did not give as uniform results.

POSTOPERATIVE GASTRIC PARALYSIS.

BASTEDO (*Medical Record,* Nov. 10, 1906) reports three cases of acute gastric dilatation, each of which he considers typical of a form of the affection. The first, after curettage of both tubes and one ovary, requiring gas and ether anesthesia, exhibited for six hours the usual post-ether nausea and discomfort, then complained of severe epigastric pain, and shortly afterward vomited some yellowish fluid, with small amounts of mucus. Eight hours after operation the pain was very severe, requiring morphine for its relief. Vomiting, after being temporarily relieved, became recurrent and persistent; it was accompanied by great distention in the upper part of the abdomen. In this region there was extreme tenderness. This patient recovered under lavage and rectal feeding.

The second case had eaten excessively and imprudently, after which he was seized with a faint, dizzy sensation, accompanied by pain in the stomach which became so severe as to threaten a condition of collapse. It was associated with dyspnea and rapid, feeble pulse. There was marked bulging of the whole abdomen, so that it was tense, like a drum. Apomorphine produced at first belching and then an enormous vomitus, and brought about immediate relief.

The third case gave a history of belching of large quantities of gas. Gastric peristalsis was visible on inspection and gurgling was distinctly heard. There was no free hydro-

chloric acid and the stools gave occult blood. The stomach was dilated by carbon dioxide gas, in quantity greater than the stomach could hold, its escape into the intestine being prevented by a pyloric obstruction. This caused the patient extreme anguish and produced almost immediately a condition of collapse. The stomach-tube was immediately passed and gave instant relief.

PYLORIC STENOSIS IN INFANTS.

RAMSEY (*St. Paul Medical Journal*, November, 1906) states that from the available records of some fifty-five autopsies of cases of infantile pyloric stenosis, treated medically, there was in every instance a pyloric tumor unassociated with adhesions of any kind, a tumor varying in size, and likened to a walnut, to a hazelnut, or to a marble. It was hard, and in some cases creaked under the knife.

On microscopic examination it was noted that the enlargement was due to a hyperplasia of the circular muscular fibers, and once the longitudinal muscular fibers were found increased in size. Because of the circular constriction of the pylorus the mucous membrane in most instances was thrown into more or less marked longitudinal folds. These longitudinal folds of mucous membrane are of importance in connection with the treatment.

Even though a steel sound may be made to pass through the narrowed pylorus, this opening is not necessarily pervious to fluid. The obstruction to the fluid is due to the swollen and reduplicated mucous membrane. These folds are pressed aside by the steel sound. Usually secondary changes occur in the stomach in the direction of hypertrophy, most marked in the cases which die early, since they have not lived sufficiently long for dilatation to develop. The symptoms are vomiting, constipation, the presence of a tumor, progressive wasting, visible gastric peristalsis, and a dilated stomach. These symptoms are initiated by the vomiting or begin at the day of birth, and may be delayed according to the degree of the stenosis. In fifty-two cases the average time from birth at which vomiting appeared was seventeen days. This vomiting is forcible and expressive, and is uninfluenced by the quality of the food, though it certainly is by the quantity. It occurs almost immediately after feeding, and as a rule contains no bile. Exceptionally diarrhea is noted. The child is usually exceedingly hungry, and the tongue clean and moist.

The first case reported exhibited typical symptoms in the second week. Dr. Goodrich operated. The case terminated fatally in five days.

The second case also exhibited typical symptoms which began at the end of the second week of life. This child died before it could be gotten in shape for operation. The pyloric obstruction was so close that only a small-sized probe could be passed.

VARICOSE VEINS—MEDICAL TREATMENT.

Exercise and antifibrous treatment is the method praised by ROBIN (*Journal de Médecine*, No. 33, 1906), who uses also the usual local measures.

As regards hygiene, the most effective agent to stimulate the flow of blood in the veins is muscular action, so the patient should be made to exercise as much as possible, stopping if there is any pain. When not in motion, he should not stand. Internally, agents to stimulate the walls of the veins—tr. hamamelis, tr. viburnum prunif., tr. centaurea, ää pt. æq.; S.: gtt. vj each morning. Iodide of potash will prevent the sclerotic changes in the walls of the veins, and should be given in doses of about a grain twice a day. Locally, the limb should be wrapped every night in cloths wet with Goulard's extract, or in case this is refused, spread thinly with the following ointment: Potassium iodide, 3j; ergotin, gr. xlv; ext. nucis vom., gr. xv; benzoinated lard, oz. 1. For the poorer classes the bandage of Velpeau is better than an elastic stocking. If a stocking is used it must rise well above the knee. Massage is advantageous and is most effective after a bath; all hard or tender points must be avoided in this rubbing, lest thrombosis and embolism occur.

REVIEWS.

A TEXT-BOOK OF PHARMACOLOGY. Together with Outlines for Laboratory Work. By Torald Sollmann, M.D. Second Edition, Thoroughly Revised and Enlarged. W. B. Saunders Company, Philadelphia, 1906. Price $4.00.

The first edition of this book appeared in September, 1901, and was at once recognized as being a distinct addition to the literature of the subject of which it treats. The present edition is much larger than the first, and has been entirely reset in type. It contains an immense amount of information which is not commonly found in text-books on Therapeutics and Materia Medica, giving facts in regard to Pharmacy, Prescription-writing, Toxicology and Laboratory Work, and Tables of Solubilities and Doses. Indeed, it is difficult to conceive how any book of its size could be written which would contain information covering so wide a range of that part of medicine which is directly or indirectly concerned with the administration of drugs. In order to save space a very large amount of the text is printed in small type, although much of the information which is given in this small type is quite as valuable as, if not more so than, some of that which is given in the regular text. The consideration of drugs is according to a classification not commonly found in other books upon this subject, and the book deals much more with the work of the pharmacologist than it does with the work of the practical therapeutist; thus, the therapeutics of so important a drug as opium covers but little more than two and a quarter pages, most of which is in large type.

Another instance of very brief consideration of important therapeutic substances may be found under "Arsenic," in which about half a page is devoted to the use of this important drug. The reference to its employment in chorea is, we think, unsatisfactory. While it is true that there is no scientific basis for its employment in this disease, it certainly has been proved empirically to be very useful.

To those who are engaged in pharmacological work the book possesses great interest because it gives us information concerning the influence of drugs upon different animals, care being taken to point out that the drug sometimes affects one animal in one way and another animal in another way.

In the consideration of the various antipyretics we think that scarcely enough attention is paid to the influence of these drugs upon the nervous control of heat production and dissipation, but we are glad to see that the author places in italics the important statement that these antipyretic drugs have no direct effect upon a fever except in so far as the temperature is concerned. On the other hand, those physicians who are best qualified to determine the value of cold bathing in fever will certainly take radical exception to the author's statement in concluding this subject that "the best general treatment of fever consists in a combination of antipyretics and graduated baths." To this we are strongly opposed, as we believe that it is quite erroneous if not dangerous in its effects.

A valuable conclusion, as reached by the author, and stated in a few words, is that alcohol can be employed as a food only when a sufficient supply of energy cannot be obtained from an ordinary diet. In other words, the author is of the opinion that in many conditions the administration of alcohol is of distinct therapeutic value, an opinion which many pharmacologists attempt to negative.

In other portions of the book very valuable and rather exhaustive discussions occur as to the means of absorbing, retaining, and excreting drugs, as, for example, in a discussion of the pharmacology of the iron preparations. Here, again, we are

glad to notice that the author, while admitting from a pharmacological standpoint that the use of iron does not always seem wise, nevertheless points out that clinically it produces good results. We can scarcely agree, however, with the statement that in the administration of iron the object is to give a maximum dose with a minimum of digestive disturbance. We believe, on the other hand, that excepting in certain conditions small doses of iron are very much more useful than large doses.

Toward the close of the book several pages are devoted to bibliographical references. The author is careful to state that he has not attempted to give a complete bibliography, which is impossible, but we think that he has failed, in a number of instances, to refer to the books and monographs which certainly are more important than some of those which he names. This criticism is, however, largely negatived by the introduction, further on in the book, of a still more exhaustive bibliography arranged under the authors' names.

Our readers will be interested to know that if they wish a book which will give them a vast amount of information in regard to the science of drugs, they will find it between the covers of this volume. If they want definite directions as to the best means of administering remedies or of combining them for administration, they will be disappointed. Again, if they want valuable information in regard to toxicology, they will find much, and if they are teachers and wish to outline a course in experimental pharmacology for their students, they will be again gratified by a perusal of this volume.

CONSERVATIVE GYNECOLOGY AND ELECTROTHERAPEUTICS. By G. Betton Massey, M.D. Fifth Edition, Illustrated. The F. A. Davis Company, Philadelphia, 1907. Price $4.00.

Dr. Massey has long been known by members of the medical profession as an enthusiastic electrotherapeutist, and one who has a firm belief in the value of electrotherapeutic measures in the treatment of diseases of women. He has for many years strongly advocated such a plan of treatment in many conditions which most of his gynecological brethren believe can only be relieved by operative treatment, but he at least possesses the courage of his convictions and claims that with increasing experience he has no reason to withdraw his confidence in the procedures which he originally followed. A number of the grave pathological changes in the genital organs of women which he thinks can be cured by these measures certainly do not seem suitable to electrotherapeutics. On the other hand, there are a considerable number of functional disorders in which much actual or mental relief can be given, and this book is one which provides the practitioner with perhaps the best summary of the subject which is published in this country. It is copiously illustrated, and the illustrations are of such a nature as very materially to aid in the employment of the measures which Dr. Massey advocates.

ORGANIC AND FUNCTIONAL NERVOUS DISEASES. By M. Allen Starr, M.D., Ph.D., LL.D., Sc.D. Second Edition, Thoroughly Revised. Illustrated. Lea Brothers & Co., Philadelphia, 1907.

When the first edition of Dr. Starr's book on Nervous Diseases appeared some years ago we called the attention of our readers to the fact that it was the production of a man of wide experience in clinical neurology and one who had done considerable investigation along these lines, and that it embodied to a very large extent the best of current neurological literature. The second edition, which the author has carefully revised, is a larger book, both in volume and in scope, than its predecessor. The first edition dealt only with organic nervous diseases, but the new edition is characterized not only by careful revision of the articles upon organic nervous diseases, but includes a section upon Functional Nervous Diseases as well. On the other hand, there are some diseases commonly considered in books on neurol-

ogy which do not find a place in this volume, as, for example, tetanus and hydrophobia, scleroderma, and angioneurotic edema. Dr. Starr excludes these articles from his book on the ground that they are generally considered in works on general medicine and do not belong to neurology, although he admits that most of our knowledge concerning them has been contributed by neurologists. A feature of the book which has always been of very great value are the excellent colored and black and white illustrations which are found in its pages, and which add not only to the beauty of the volume but also to the ease with which certain of the pathological and clinical descriptions can be understood.

To practitioners who began the practice of medicine twenty years ago the advances which have been made in the study of neurology are in many instances almost unknown. At that time there were only one or two large books upon this subject in the English language, and their contents when compared at the present time with the contents of this volume make them seem as if their text had been prepared in the early part of the last century. The present work is one which can be most cordially recommended as being one of the best single volume works on nervous diseases in the English language which our readers can obtain.

AN ATLAS AND TEXT-BOOK OF HUMAN ANATOMY. By Dr. Johannes Sobotta. Edited, with Additions, by J. Playfair McMurrich, A.M., M.D. In Two Volumes. Price $6.00 a Volume.

This Atlas will certainly prove a delight to students and of great value to practitioners. It is not an exhaustive one dealing with microscopical and other matters which are of little interest to practical men, but deals more intimately with regional anatomy, and the excellent full-page plates which are found in large numbers between the text are not only executed with great skill and accuracy, but are lettered in such a way as to make the study of anatomy easy and entertaining. The second volume, which deals with the anatomy of the viscera, including the heart, is, of course, the one which appeals to practitioners more than the first. We know of no atlas which can be recommended more cordially for the practical man than that now under notice.

A SYLLABUS OF LECTURES ON EMBRYOLOGY. By W. P. Manton, M.D. Third Edition, Illustrated. The F. A. Davis Company, Philadelphia, 1907. Price $1.25.

This small volume of 136 pages is especially designed for students in their first and second years at a medical school, and also for such practitioners as may wish to review their knowledge of this interesting subject. It is not, of course, an exhaustive work on embryology. On the contrary, it is a brief summary of modern views concerning this department of medical science, and in this sphere can be cordially recommended.

THE ELEMENTS OF THE SCIENCE OF NUTRITION. By Graham Lusk, Ph.D., M.A., F.R.S. (Edin.). The W. B. Saunders Company, Philadelphia, 1906. Price $2.50.

This octavo volume of 326 pages is designed "to review the scientific substratum upon which rests the knowledge of nutrition in health and disease." The author has endeavored to make no statement in the book for which he cannot give adequate proof that it is scientifically correct.

Most of the work which has been done along these lines has been carried out in Germany and very little in the United States. As Dr. Lusk is known far and wide as an original investigator and authority upon this important subject, what he has to say about it will be read with interest by those who are particularly interested in this branch of investigation, a branch which unfortunately is not as interesting to a general practitioner as it should be, perhaps because in the past it has seemed so great a distance between the results of these scientific investigations and practical medicine at the bedside, and also because in a large number of instances the scientific results have not in the end proved sufficiently correct to obtain the confidence

of practical medical men. At the present time, however, with greater refinement of knowledge, certain conclusions have been reached which are almost certain to remain generally accepted for many years to come, and it is chiefly these which Dr. Lusk has presented in a concrete form for our careful consideration.

A TEXT-BOOK OF PATHOLOGY. By Alfred Stengel, M.D. Copiously Illustrated. Fifth Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1906.

The first edition of this very excellent book upon clinical pathology appeared in September, 1898, and at once obtained for itself a warm reception on the part of students and practitioners, being written by one who combines large pathological and clinical experience. It is not designed as a text-book on purely scientific pathology, but, as we have already intimated, as a handbook for the practitioner who wishes a clear conception of the pathological processes which it is his duty to diagnose and treat. The present edition has been thoroughly revised and brought up to date, and will undoubtedly continue to maintain the popularity which the book has achieved in earlier editions.

A TEXT-BOOK UPON PATHOGENIC BACTERIA. By Joseph McFarland, M.D. New Fifth Edition. The W. B. Saunders Company, Philadelphia, 1906. Price $3.50.

When the first edition of Dr. McFarland's book upon Pathogenic Bacteria appeared, it at once took a place peculiar to itself, as it afforded medical men a complete yet not too diffuse description of our knowledge of this important subject. The fact that it has reached its fifth edition within comparatively a few years, the first edition appearing about ten years ago, indicates that although it deals with a subject which is of greater interest to the student and original investigator than to the general medical man, it nevertheless is prepared in such a way as to be of interest to the latter class. While it contains much in the way of laboratory technique which the untrained practitioner will not be able to utilize, on the other hand it gives him a conception of our present knowledge of pathogenic bacteria which he would be able to obtain only by wide reading and careful study extended over a long period of time.

MATERIA MEDICA FOR NURSES. By Emily A. M. Stoney. Third Edition, Thoroughly Revised. The W. B. Saunders Company, Philadelphia, 1906. Price $1.50.

In addition to describing ordinary matters in connection with Materia Medica for the use of nurses, this volume also contains an appendix which deals with poisons and their antidotes, with mineral waters, weights, measures, a dose-list, and a glossary of the terms used in materia medica and therapeutics. It is of course of no value to the medical man unless perchance he be a lecturer on this subject in a training school for nurses, and is looking for an excellent book to put in the hands of his pupils, who should be provided with enough information to render them competent assistants to the physician who may give them orders, and who, on the other hand, should not be taught so much and yet so little that they have sufficient confidence in themselves to attempt to prescribe without first appealing to a medical adviser.

OBSTETRICS FOR NURSES. By Joseph B. De Lee, A.M., M.D. Second Edition, Thoroughly Revised and Enlarged. The W. B. Saunders Company, Philadelphia, 1906. Price $2.50.

This copiously illustrated book is an excellent one for the purpose for which it was devised, and has won for itself a valued place amongst the text-books which are provided for nurses who are carrying on their education in well-equipped training schools.

GENITO-URINARY DISEASES AND SYPHILIS. By Henry H. Morton, M.D. Second Edition, Revised and Enlarged. F. A. Davis, Philadelphia, 1906.

The second edition of Morton's book, admirably illustrated and most carefully revised, will be welcomed by all who are familiar with this author's clear style of writing. The subject-matter is embraced

in less than 500 pages of large type, hence there is considerable condensation, but not at the expense of the omission of vitally important matter. Under directions for suture of the bladder after removal of calculus from the viscus which is not inflamed, the author states that the first row is so arranged as to bring the serous surfaces in contact, without allowing the sutures to appear upon the inside of the bladder, and the second row is placed above the first and holds the incision tightly together, preventing leakage. The incision for stone is usually made through a portion of the bladder not covered by serous membrane. Nor is this the technique which has given most success in the primary closure of these wounds.

It is noteworthy that Morton believes mercury should not be given until the secondary eruption appears, that he is a firm believer in colossal doses of iodide, and that his treatment stops at the end of three years in the absence of direct manifestations of the disease. There is a brief chapter upon impotence, sterility, and allied subjects, and an appendix containing the technique for the microscopical examination of urethral discharges, tubercle bacilli, spirochæta pallida. This work represents perhaps the most condensed summary of genito-urinary diseases to be found.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D., F.R.C.P.

Among the interesting events of the month, one which has brought together members of the profession from all parts of the United Kingdom is the conference on hospital abuse which was recently held at University College, London. Sir William Church, late president of the Royal College of Physicians, took the chair, and the meeting was well attended, for it is well recognized by those who are on the staffs of our London hospitals that the out-patient system has gradually grown into a gigantic abuse: indeed, it ought to be reckoned as one of the many well-intended but ill-advised charities which are slowly but surely pauperizing and demoralizing the middle classes as well as the lower classes in this country. Sir Henry Burdett, who is well known as one of our best-informed authorities on hospitals and hospital organization, stated that no less than 1 in 2 of our whole London population now obtain free medical treatment, whereas thirty years ago 1 in 4 received free treatment. With such a state of things it is no wonder that frequent letters appear in our medical journals complaining that the general practitioner is being ousted by the hospital out-patient department, and that even the daily papers have recently been devoting part of their columns to the discussion of this grievance. But there is another aspect of the subject which was touched upon by Dr. Heron: the hospital out-patient physician in London to-day has often to see a continuous stream of patients for three, four, or even five hours, and, he might have added, is in some hospitals expected to teach during this time also. Dr. Heron gave vent to an ejaculation of fervent pity for the patients who came to this exhausted adviser last. However, after all this and much more talk the conference ended in little more than a pious expression of opinion, and it seems likely that this problem of hospital abuse, which, as Sir William Church mentioned, was already being considered two hundred years ago at St. Bartholomew's Hospital, will continue to form subject-matter for conferences two hundred years hence.

At the Medical Society this month there was a discussion on hepatic inadequacy, which practically resolved itself into a consideration of the pathology and treatment

of gout. Sir Lauder Brunton pointed out that in otherwise healthy persons one or other organ may be functionally incapable of performing more than a limited amount of work: for instance, in one person the muscles were incapable of hard physical work, in another the stomach could deal only with the simplest of food, in another the kidneys could only remove an unusually limited amount of waste material. So with the liver there might be an unusually limited power of dealing with carbohydrates in one case, and of dealing with purins in another. Sir Dyce Duckworth doubted whether uric acid is the cause of gouty symptoms, but he was pleased that there should be no mention of microbes in connection with the etiology of gout. In this, however, he was not in accord with some subsequent speakers, who suggested that gout might be due to some toxin produced by bacteria in the intestine. One speaker pointed out that gout is sometimes an acquired disease, and can then be treated by diet, whereas in other cases it is inherited, and dieting is then quite ineffectual. Dr. Ewart regarded it as primarily a disturbance of function. It would have been somewhat of a shock to those who have made uric acid responsible for a large proportion of "the ills that flesh is heir to" to hear Dr. Luff say that uric acid could not be described as in any sense a poison; it is a comparatively harmless by-product of metabolism and has been converted into a fetish by recent fashion.

At the Pathological Society of London an evening was devoted entirely to some interesting observations by Dr. Chalmers Watson, who has recently been making experiments on rats, feeding them with meat only, and in this way producing softening and curving of bones, and certain changes in the thyroid gland. Dr. Spriggs pointed out that the changes in the bones might be due less to the fact that meat was given in excess than to the deficiency of lime salts involved in such a diet.

Considerable interest was aroused by a recent trial, in which two medical men were the defendants, and the plaintiff brought an action against them for negligence on the ground that they had treated a fracture of the surgical neck of the humerus as a dislocation; damages to the extent of £2000 were claimed. The defendants declared that there was dislocation as well as the fracture; the plaintiffs argued that x-rays ought to have been used to make the diagnosis certain, that reduction with the foot in the axilla was wrong, even if there had been a dislocation, and that the permanent limitation of movement was the result of the treatment, for skiagrams taken subsequently showed considerable malposition of the united fracture. Seldom is there such a distinguished list of witnesses as appeared in this on both sides. For the plaintiff Messrs. Pepper, William Rose, and Battle appeared, whilst the two defendants, both in practice at Cardiff, were supported by Mr. Anthony Bowlby, Sir Frederick Treves, Mr. Page, Mr. Edmund Owen, Sir Thomas Smith, Sir William Bennett, Mr. Lane, and Mr. Waterhouse. The jury were unable to agree until they had retired three times and deliberated for over three hours, when they gave their verdict against the defendants, and awarded the plaintiff £100. This decision has provoked much indignant criticism amongst the profession; and it is hoped that the judgment may yet be revoked, for notice of appeal has been given.

A lecture was given this month by Dr. H. Thursfield on congenital syphilis, in which he referred to the present position of the spirochæta pallida in the etiology of this disease. He said that the rejoicings over the supposed discovery of the cause of syphilis are premature, and that organisms quite indistinguishable from this spirochæta are to be found in a variety of other conditions, so that the diagnosis of syphilis cannot at present be confirmed by the finding of the spirochæta.

There certainly is a great tendency to jump at the latest announcement of causes as well as cures, and Mr. Edmund Owen, who is often startling and always interesting, did well to protest in his recent Bradshaw Lecture, delivered at the Royal College of Surgeons this month, on cancer and

its treatment by modern methods, against the ill-considered "cures" which are constantly appearing especially in the lay press.

A large windfall for hospitals and other charities has become available within the past few weeks by the death of Miss Lucy Cohen, who left £57,000 for distribution amongst various institutions, including several London hospitals, particularly the Hospital for Sick Children, Great Ormond Street, to which this lady some years ago gave two wards which are named after her.

"The Polyclinic," as it is usually called, held its annual dinner a few weeks ago, and Prof. Clifford Allbutt took the chair. This institution is a postgraduate college without any hospital attached. It owed its inception largely if not entirely to Mr. Jonathan Hutchinson, and has been greatly appreciated by practitioners residing within the area of "Greater London"—indeed, there are probably few lecture-rooms in London which could show so good a daily attendance as those of the Polyclinic.

The proposed Academy of Medical Sciences which is to be formed by the amalgamation of several of the chief medical societies of London seems likely to be an accomplished fact within the next year, in spite of considerable opposition and some gloomy prognoses; several of the best known societies have recently passed a final resolution agreeing to take part in the scheme.

Influenza has become widely prevalent in London during the past month, and its mortality has increased greatly in the past two weeks, partly perhaps owing to respiratory complications, for the cold has been intense, and London is wrapped in snow.

ANESTHESIA BY THE DROP METHOD.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I am a recent subscriber to the THERAPEUTIC GAZETTE, and in the November number I read with much interest the article on "Ether Anesthesia by the Drop Method."

I use, and have used, the drop method the same as Dr. Kennedy, dropping the ether continually without intermission until the patient reaches surgical anesthesia, and I find that patients are more easily controlled and stand the ether much better than by the "instalment method." I anesthetized for Dr. John E. James and others of Philadelphia, and for Drs. Honan, Bagg, Carleton, and others in New York. Of the many inhalers on the market I prefer Allis's, covered with a towel and so pinned that the thumb of the left hand can be thrust in at the pinning point and so control the inhaler.

I differ with Dr. Kennedy on two points: First, to hold or splint the patient's jaw is not necessary until the relaxation sets in, because (*a*) it is unnecessary, and (*b*) because the patients, especially foreigners who do not understand our language and cannot be made to understand, resent it and are annoyed. This annoyance may unduly excite them, and they will take the ether badly. Secondly, in reference to folded gauze instead of an inhaler: while this is a clean method and has its advantages, yet an Allis inhaler is just as clean, can be controlled more easily, and does not allow the ether to evaporate as quickly as the gauze towel. Therefore it saves ether.

If for any reason it is necessary to "hurry" the case along I have found dropping the ether from a higher point seems to intensify the action in some unexplainable way. The hand or a hot towel placed over the ether cone will have the same effect.

The sighing respiration has always been to me a sure sign for more ether, although I never neglect the pupilary and conjunctival reflexes. If a case be started by the drop method, all violent restraints abandoned, and the patient kept at the midpoint pupil stage, fully 90 per cent of the cases, if they have had a 24-hour preparation, will recover from the effects of the ether without vomiting unless the patient be picked from the stretcher and dropped into the bed with a thud. With these few exceptions to Dr. Kennedy's article I say, Amen!

JOHN W. REITH, M.D.

LANCASTER, PA.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., MARCH 15, 1907. | Third Series, Vol. XXIII, No. 3.

ORIGINAL COMMUNICATIONS.

FRACTURES OF THE FEMORAL NECK—ANATOMIC TREATMENT.

BY C. E. RUTH, M.D.,

Professor of Principles and Practice of Surgery and Clinical Surgery, Keokuk Medical College, Keokuk, Iowa.

Professional incapacity in the management of these cases is the only justification for the text-book unanimity regarding the unsatisfactory results obtained in the treatment of this injury, particularly in the aged and feeble.

From reports of over one hundred cases treated by the "anatomic method," and from six bone specimens procured from the same, I have no hesitation in saying bony union will occur in almost if not in every patient properly treated for five weeks at whatever age and in whatever condition. These cases have recovered with ability to walk well, usually without crutch or cane, without limping in many cases, and in not a few without demonstrable shortening. While recovery without shortening may be considered an absurdity, two of the bone specimens shown in the accompanying illustrations prove the claim, and others show the shortening to be so slight as not in any sense to produce impairment of function.

To my late colleague, Prof. T. J. Maxwell, is due all the credit for discovering and outlining the main features of this treatment thirty-five years ago. I have seen fit to denominate it the "anatomic method," because when properly applied it places all the parts concerned in their normal relations, overcomes the displacing influences of muscular action and the weight of the limb, keeps all soft tissues from interfering with union by being caught and held between the fragments, uses the intact portion of the capsular ligament to align and maintain perfect relations of the fragments at all times, even when the patient is raised to the sitting posture; it causes no pain, but will always relieve the pain from which these cases so often suffer severely, especially upon the slightest movement. It is applicable to all kinds of fractures of the femoral neck and to every physical condition and age of the patient. It can be properly applied by any one with the most ordinary mechanical ability at an expense of from ten to fifty cents, and in three-quarters to one and one-half hours' time.

Successful cases are reported from all methods of treatment, but the results even in hospital service under the care of the best surgeons in the world are so notoriously unsatisfactory on the whole from great pain, frail limbs, great shortening, impaired mobility, and death, that it presents a sad picture indeed.

The method herein presented has not failed to produce good union at whatever age where the treatment has been continued for four weeks, and without pain to the patient. We must forever abandon the old theory that the blood-supply is inadequate, the synovial fluid interferes with solidification of the callus, or that immobilization of the fragments cannot be secured.

The essentials of treatment, briefly stated, are:

1. Reduction of the fracture by flexing the thigh at right angles to the trunk to bring the line of action of the psoas and

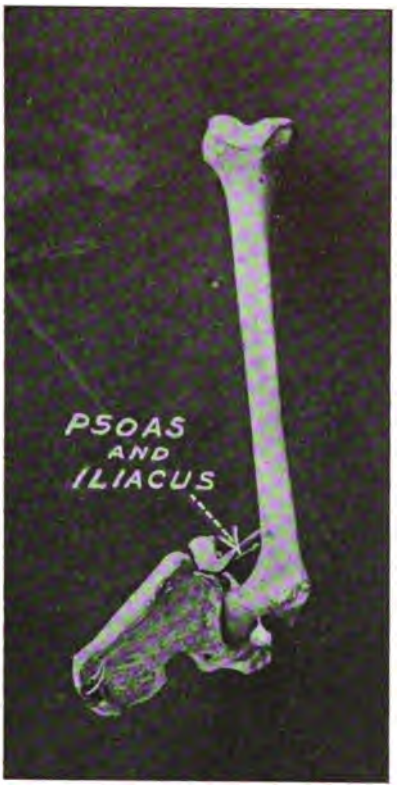

FIG. 1.—Shows psoas and iliacus out of reach of the fragments, when thigh is flexed at right angles to the trunk, so they cannot force soft parts between the fragments. This position should always be the first step in reducing fractures of the femoral neck.

iliacus above and away from contact with the anterior surface of the capsule, so that the muscular action cannot force soft parts between the fragments or disturb alignment (see Figs. 1, 2, and 3).

2. Outward pull upon the upper end of the lower fragment by an assistant to bring the trochanter major as prominently on the injured as on the sound side, while traction is made on the limb in the long axis of the body until all displacement and deformity, as indicated in the length of the limbs, position and prominence of the trochanter majors, are overcome.

3. The adjustment of a steady lateral pull on the upper end of the lower fragment, and by Buck's extension and counter-extension to the limb in line with the body to maintain normal length of the limbs.

4. The adjustment of the traction by weight and pulleys to the extremity in line with the body and the lateral pull so that there shall be no tendency to shortening, eversion of the foot, flattening of the hip, or dropping of the great trochanter on the injured side behind and internal to its normal level with the opposite side because of weight or muscular action. Such a plan of extension, counter and lateral extension, will, when properly applied, overcome the action of all the powerful muscles passing over the fracture line, some of which act vertically, as rectus, biceps, sartorius, semitendinosus, semimembranosus, gracilis, tensor vaginæ femoris, and vertical portion

FIG. 2.—Shows fracture of the femoral neck changing point of resistance from the femoral head to the great trochanter, making the psoas and iliacus powerful external rotators instead of internal rotators. It also shows the tendency of the muscles to fall or force the capsule between the fragments, preventing bony or other useful union. This muscle action is easily shown by the above demonstration. This is the principal reason for eversion of the foot almost always noted in these fractures, not impacted, rather than weight of the limb as formerly supposed.

of adductor magnus; obliquely, as the adductors, glutei, and pectineus; transversely, as the gemelli, quadratus, pyriformis, and obturator; while the powerful psoas and iliacus, formerly neutral or internal rotators, now become powerful external rotators because of the change in the point of resistance to their line of action, which formerly passing through or internal to the femoral head, now has become external, falling through the greater trochanter.

FIG. 3.—Shows normal position of the psoas and iliacus in extension, resting directly in contact with and pressed firmly against the anterior surface of the capsule. Also shows muscles are internal rotators or neutral while femoral neck is intact, because resistance (femoral head) is internal to the line of action of the muscles.

The foot of the bed must be raised enough to overcome by the body weight the tendency to slide toward the foot of the bed; the side of the bed corresponding to the injury must also be elevated to overcome by body weight the tendency to be drawn toward the lateral point of traction. The lateral traction must be made sufficiently forward (from 8 to 15 inches) as well as outward to raise the upper end of the lower fragment to a position corresponding with that of the opposite trochanter, and to overcome all tendency to eversion of the foot by the extra external rotating force of the limb's weight and the altered rotating action of the psoas and iliacus (Fig. 6).

Such an adjustment of traction force will cause the resultant of the traction to be in line with the neck of the femur, and so use the intact portion of the capsular ligament as a close-fitting sleeve to adjust and align all fragments. It must therefore follow that as no muscle or other displacing force can act directly upon the upper fragment, which is perfectly passive, and which by its free mobility in the acetabulum will be at once in perfect alignment with the lower fragment, if the proper amount of traction be steadily continued that adjustment of the fragments must continue whether the patient be lying flat on the back or in the sitting posture. This fact has enabled all patients treated by this method to be raised daily or several times daily to the sitting posture for cleansing, or if needed remain a few moments in this position to rest, to relieve the tendency to hypostatic congestion, or to bathe and massage the back.

No pain whatever results from this elevation to the sitting posture, and no possible disturbance takes place in the relations of the fragments.

The longitudinal traction by Buck's extension over foot pulley will in a well-developed male require to be fifteen to twenty-five pounds, and the lateral traction about two-thirds as great as the longitudinal, usually ten to sixteen pounds. The weights must be greatest at first and reduced later, as the muscles tire and cease all spastic contraction. The height of the lateral pulley will vary with the amount of weight and eversion tendency in the thigh, and usually presents a forward and outward pull at an angle of forty-five degrees. The elevation of the foot of the bed will usually be about 10 inches and the side

about 5 inches, each to be just enough in every case so that the patient's body weight will overcome the tendency of the patient to be displaced toward either traction point. When the traction force is so adjusted that it overcomes deformity by overriding of fragments, and overcomes muscular spasm, the patient will be free from pain. The use of buckets or jugs containing sand or water attached to lines over the pulleys enables a ready adjustment of the weight to the needs of the case by removal or by additions to their contents.

FIG. 4.—Position and dressing as ordinarily applied at home with jug or bucket filled with sand or water to regulate the amount of weight.

The adhesive plaster used for the traction should be strong, have good adhesive property, and be non-irritant to the skin; it should be at least two inches wide. It is placed on the leg and thigh after shaving, and should extend from three inches above the ankle to at least the middle of the thigh to give extensive traction surface, and thereby avoid slipping or discomfort from the heavy traction on a small skin area. The long strips should be reënforced by an encircling strip above the ankle, above the knee, and at the upper extremity of the plaster, and should be kept at least some hours in close contact with the skin throughout by slight compression of a well-fitting roller bandage to insure even and strong adhesion at all points. A spreader foot-piece should be so placed as to keep pressure off the malleoli. Around the upper anterior, inner, and posterior aspects of the thigh should be molded a binder's board six inches wide to prevent rolling up of the bandage or adhesive plaster attached to the lateral traction, thereby preventing the discomfort of cutting into the thigh by string-like constriction. The lateral traction must pass around the binder's board as high up as possible; this plan will sufficiently distribute the traction that no discomfort is produced by the lateral pull. The patient will from the first be able, by aid of the sound leg, to lift the hips so that the bedpan can be easily placed without pain to the patient or any

possible disturbance of the fragments. Every two or three days the longitudinal pulley traction should be substituted by equal hand pull upon the thigh, while the knee is raised and the leg flexed at least thirty degrees to prevent ankylosis, which will otherwise in some cases be very annoying. This also can be done without any pain or disturbance of the fragments. Failure to heed this last precaution has caused all the discomfort and incapacity resulting from the injury in three cases treated by this method.

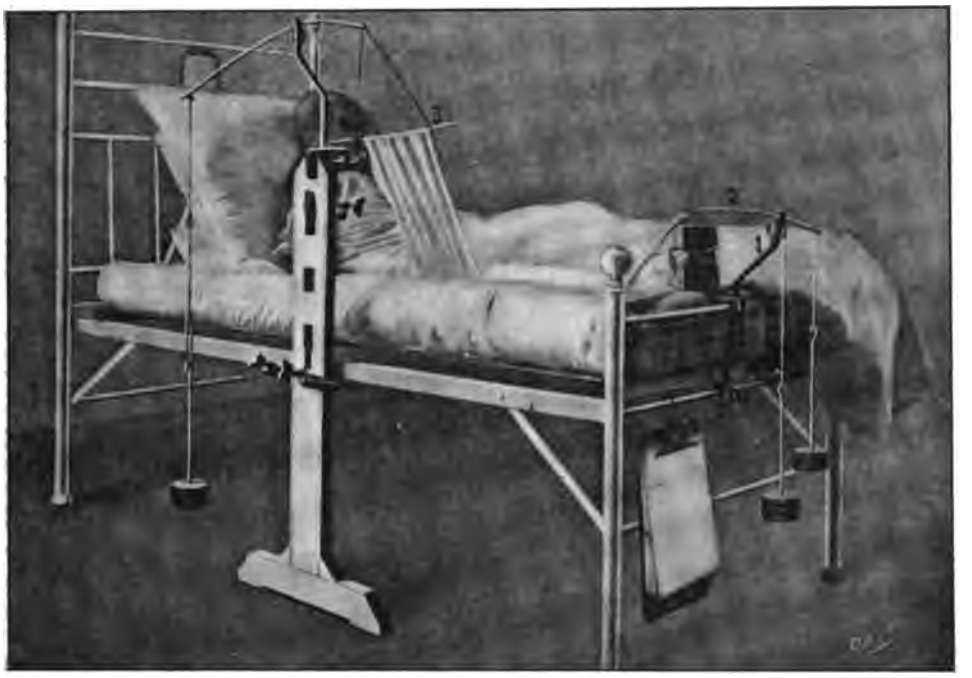

FIG. 5.—Ruth's extension apparatus. As illustrated by Fowler, Volume II, page 512, the patient in semisitting posture, the foot and side of the bed not raised. 1, Buck's extension in the long axis of the limb; 2, lifting arrangement for relieving the pressure on the heel; 3, lateral extension and inward rotation apparatus (Ruth).

There is not the slightest need for differentiation of the various forms of fracture of the femoral neck, as all varieties are reduced and maintained in the best possible position by the same means.

Impacted fractures of the femoral neck in good position require no treatment but rest if the impaction remains. Should marked deformity exist, as indicated by shortening, eversion, or inversion, the impaction should be broken up, and reduction accomplished and maintained as above outlined. While the main part of the anterior portion of the capsule passes from the rim of the acetabulum to the intertrochanteric line, there are many strong fasciculi passing between the femoral neck and the capsule on the anterior as well as posterior surface; these are so many and strong that even in cases in which the femoral neck is comminuted and the capsule one-half destroyed, if traction be made sufficiently strong in line with the normal position of the femoral neck all fragments will be at once aligned, and if the traction be made continuous reduction must remain permanent and union will be certain if the patient lives four weeks. In almost all cases the capsule is not extensively lacerated unless unwarranted manipulation is done, so that if the anatomic method is followed the capsule acts not only by its sleeve-like adjustment but by aid of the fasciculi to maintain the fragments in position. I have abundantly proven these facts by experiments on the cadaver and illustrated the same by wet specimens.

In cases of children especially if impaction has occurred the method of Whitman, viz., forced abduction to the limit of the abduction range of the opposite limb as a guide, will render the anterior portion of the capsule (which is always intact) taut, as soon as the top of the great trochanter impinges against the upper edge of the acetabulum, and give the neck of the femur the proper angle with the shaft. This position will adjust and maintain proper re-

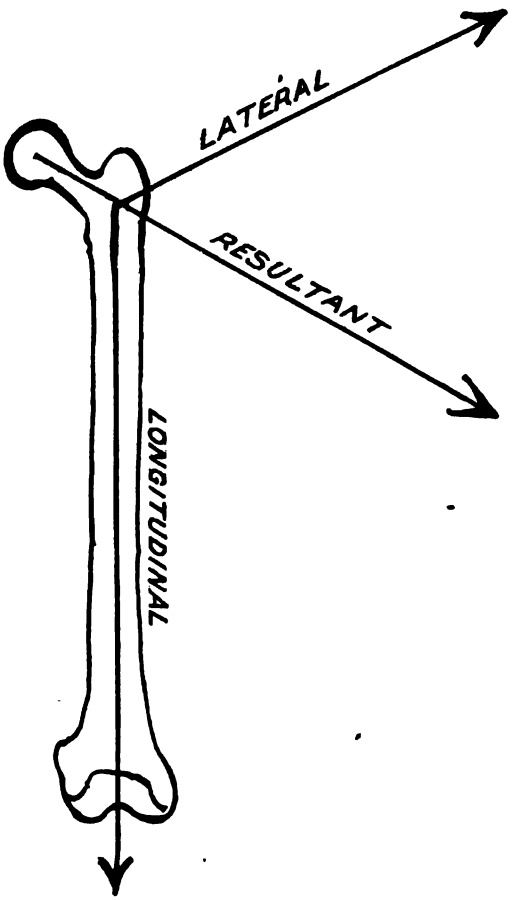

FIG. 6.—Longitudinal, lateral, and resultant forces. (Moore.)

lations of the fragments while the position is maintained by plaster of Paris.

This method of Whitman's is for children, I believe, next in importance and value to the anatomic method. I do not understand that Whitman ever advised the method for adults, nor do I think it should be so used, though Ridlon has championed the method for adult cases, adding thereto, however, heavy traction in the abducted position while the plaster is being applied for the purpose of securing fixation and maintaining a degree at least of extension.

The following objections will always obtain to the method:

First, fractures through and causing separation and splitting of the great trochanter make the correction of the deformity impossible by abduction, because the leverage of the femoral shaft upon the top of the great trochanter against the brim of the acetabulum as a fulcrum cannot be used to render the capsule taut and so secure and maintain alignment of the fragments. The bone specimens shown in Figs. 16 and 17 are a case in point, and illustrate the impracticability of the method. These cases can seldom be differentiated from other forms.

Second, the rapid loss of adiposis in the obese, who represent a large proportion of these cases. These are notoriously bad cases for the use of plaster because of, first, lack of fixation, and secondly, impossibility of maintaining extension. Any plaster dressing on the obese will be decidedly loose in three days; this will progressively increase at a time when fixation is imperative to obtain union with the minimum of deformity. Four to five weeks of maintained fixation and adjustment are absolutely necessary to secure union which will maintain permanent relations without progressive deformity.

Third, the aged, who form the major proportion of these cases, are illy prepared for prolonged pressure contact, hence the damage from the use of a permanent dressing, which does not admit of ready change or inspection and release of damaged points from pressure.

Fourth, adjustment and fixation can be accomplished by the much easier and safer method herein advocated.

In one of my cases daily careful adjustment of position and dressings was required to avoid extensive sloughing and bed-sores due to age and great enfeeblement. Her most intimate friends and relatives, realizing the very feeble hold she had

upon life and believing death in a few weeks at most was certain, advised abandonment of the treatment under the delusion she would be more comfortable. This patient (number seventeen in my article published in the *Journal of the* Phelps has recognized the necessity for use of lateral as well as longitudinal pull to place the joint at rest in cases of morbus coxarius, and has applied the principle in his famous long hip splint. Why the need for using the same principle in fractures

FIG. 7.—Case 14, anterior view. (See the *Journal of the American Medical Association*, Aug. 26, 1899—Ruth.) This patient was seventy-eight years old when the fracture occurred. Recovered with one-half inch of shortening. No impairment of function, and used the limb without cane and with no limp for eight years, doing the work of a farmer's housewife without domestic assistance.

American Medical Association, Aug. 26, 1899) made a recovery without shortening, no impairment of function, and walks without crutch or cane, without limp or halt, having had good use of the limb for nearly eight years.

For many years no less an authority than of the femoral neck was not sooner recognized I cannot understand.

Case 43, reported by Dr. C. S. Bishop, of Fairfield, Iowa. B. D., aged nine years, was kicked by a horse on the right hip at 5 P.M. March 30, 1895. Stood all night on opposite leg leaning against his father.

The foot of the injured leg was everted and one and one-half inches from floor. Pain severe. He was put to bed, and under anesthesia the hip, which was supposed to be dislocated, was found to give crepitus; trochanter rotated in same position without describing an arc of a circle.

Fig. 8 – Case 14, posterior view.

Shortening one and one-half inches; complete eversion. Diagnosis, intracapsular fracture of the neck of the femur. Treatment as recommended by Professor Maxwell. Extension nine pounds (longitudinal), lateral extension six pounds, corrected tendency to displacement. Three days later patient was moved two miles to his home on a cot. At the end of the week longitudinal weight was reduced to six and the lateral to four pounds. Allowed to sit up in bed as much as he desired, and to move about as much as the cords and weights would permit. No pain following first six hours after adjustment of appliances. Patient ate and slept well. Put on crutches after twenty-fourth day. Six months after no limp, no shortening, perfectly useful limb. So slight was the discomfort during the treatment that he said he intended having the other leg broken to double the donations received during confinement from relations and friends.

Case 44, reported by Dr. I. S. Buzard, of Russell, Iowa. W. W. A., aged twelve years, on January 5, 1905, sustained a fracture of the neck of the femur. Shortening

FIG. 9.—Fracture of neck of femur. Case 2. (See the *Journal of the American Medical Association*, Aug. 26, 1899—Ruth.) Fracture occurred at seventy-two years of age; leg was used for twenty years afterward. No perceptible shortening.

two inches, slight eversion. Diagnosis made under anesthesia. March 16, 1905, slight eversion, shortening three-fourths of an inch, some limp, union good, using crutches, but can bear weight on limb and can walk without pain. September, 1905, three-fourths of an inch shortening, some eversion and stiffness.

Cases 45 and 46 I append below in full as reported to me by Dr. Walter L. Hunt, visiting surgeon to M. E. Hospital, Bangor, Me. The only remark I wish to make relative thereto is that in the case reported as 46 Dr. Hunt has given the age as seventy-nine, while in a previous letter to me he gave the age as eighty-four; the latter is probably correct. Case 25, reported by me in the *Journal of the American Medical Association* of December 21, 1901, and treated by F. S. Rebo of Alexandria, Mo., and W. A. Rebo of Canton, Mo., was eighty-six years old. This patient recovered without perceptible shortening, and used the leg for several years afterward without impairment of function.

Case 45, reported by Dr. W. L. Hunt, of Bangor, Me. Mrs. E., of Brewer, Me., a farmer's wife aged seventy-six years six months and three days, on August 10, 1903, while lifting a child into a wagon fell backward with the child in her arms, receiving an intracapsular fracture of the left femur. With my son, a medical student, as assistant she was etherized, and there were present pain, preternatural mobility, audible crepitus, from one to two inches of shortening, marked eversion, and the trochanter major made no excursion on rotation. She was treated by Professor Maxwell's method, and was very comfortable while the bone was healing. She was first dressed on October 6, 1904. For some time after this date she had a bad knee, due to great carelessness on my part in not seeing that the knee should be much more frequently flexed. At the present time she goes everywhere she wishes, has no limp, and has one and one-eighth to one and one-fourth inches of shortening. For a period of six weeks while a barn was being erected

FIG. 10.—Vertical section of Case 2. (See report in the *Journal of the American Medical Association*, Aug. 26, 1899—Ruth.) Shows bone from Case 2 removed after twenty years of service following fracture at seventy-two years of age. It shows perfect repair as to bony union in the narrow part of the femoral neck, and forever places all cavil on this point at rest, as to the possibility of securing bony union after fracture of narrow part of the femoral neck.

she this summer (1904) did the work for a family of eleven persons.

Case 46, a more remarkable one, was that of Mrs. K., of Bangor, which I saw through the kindness of Dr. Swett and his daughter Caro Swett, M.D., late of Johns Hopkins. This woman was nearly blind and fractured the right femoral neck by tripping on a rug at the age of seventy-nine years and seven months. Five days

FIG. 11.—Case 34. (See the *Journal of the American Medical Association*, Nov. 29, 1902—Ruth.) Union in four weeks' treatment not begun for one week after fracture. Position perfect. Death from cerebral softening. Had the patient lived one year the result would have been as perfect as in Case 2, with absolutely no shortening.

after the accident, which occurred July 17, 1903, she was etherized. Two inches of shortening was found, as well as crepitus, eversion of the foot, preternatural mobility, and the head of the bone made a short excursion on rotation. She was very weak and feverish and had a cough, but made a good recovery from what seemed to be an almost hopeless condition, getting out of bed about the last of September, 1903. To-day she walks without a limp and shows no remains of her accident. I cannot say how much shortening there is now, but Dr. Swett says there is about an inch. This case I am sure would have died under any other treatment. I would propose in cases of impacted fractures of the neck that the fixation be broken under ether, and this treatment followed in future cases of this fracture. I am very much pleased with these great results, and hope to see this method widely known and exclusively adopted. I have treated quite a number of cases in my twenty-seven years of active pr..ctice, and have never had a good result follow the old method. If you should have anything published in the future I would be happy to see it. Especially I would like to know if there were any failures.

Case 47, reported by Dr. O. B. Yarnell, of Bowen, Ill. Mrs. L., aged sixty years, sustained a fracture of the right femoral neck together with dislocation of the right shoulder-joint June 20, 1904, by falling from a ladder placed in a wagon while she was picking cherries. After reducing the shoulder attention was given to the lower limb, which was found to be three-fourths of an inch short and completely everted. Crepitus was present on rotating the limb. Diagnosis, fracture of the femoral neck. Treatment was by the "anatomic method" by longitudinal and lateral extension. No pain whatever after application of the dressing. Recovery took place promptly, and patient was up six weeks after injury with absolutely no shortening and with a good, serviceable limb.

Case 48 was published in full in the THERAPEUTIC GAZETTE of October 15, 1900, page 654, by Dr. J. Dutton Steele, of Philadelphia, Pa. This patient, aged fifty-nine years, weight 170 younds, January 21, 1900, fell on icy pavement, and was at once unable to walk, and was in severe pain, with eversion of foot and leg, inability to move limb, pain on movement, and one inch shortening. Two days later Dr. Edward Martin saw the case in consultation with Dr. Steele and confirmed the diagnosis

of intracapsular fracture of the femoral neck. Shortening at this time two inches; eversion complete. Under advice of Dr. Martin the dressing recommended by Dr.

FIG. 12.—Anterior view, Case 29. (See *Journal of the American Medical Association*, Nov. 29, 1902—Ruth.) Royer, aged eighty-one. Recovery functionally perfect. Death caused eight months later by sunstroke while at work in his orchard.

Ruth (*Journal of the American Medical Association*, Aug. 26, 1899) was applied. In eight weeks the following results were obtained: ability to slightly invert the limb and foot, shortening one-fourth of an inch, no unnatural mobility, and no pain. Eight months after accident patient walked without cane, except upon unusual occasions. Shortening still one-fourth of an inch, eversion twenty degrees. During the period of treatment it was extremely hard to keep the foot and leg at a proper degree of inversion. (This was probably due to lightness of the lateral pull on a limb so heavy, and the fact that the lateral pulley was not placed sufficiently far to the front.—Ruth.)

Case 49, reported by Dr. P. E. Hanes, of Maryland, Iowa. Mrs. T. S., aged sixty-three, on March 7, 1900, fell on a door-step while going out of the house, causing fracture of the femoral neck. Reduced and treated by the Maxwell anatomic method of longitudinal and lateral extension, with recovery resulting in one and one-half inches shortening. She has used the limb without crutch or cane for five years after the injury.

Case 50, reported by Dr. W. M. Haggett, of Nauvoo, Ill. Mrs. B., aged about sixty years, in September, 1904, sustained a fracture of the right femoral neck and Colles's fracture of the left radius in an accident. Dr. Haggett was called and requested the assistance of Dr. Ruth, who set and dressed both fractures. Diagnosis was made and reduction accomplished under chloroform anesthesia. Shortening of lower limb of over one inch with complete eversion, rotation of the femur, which gave no arc of a circle to the trochanter major, and crepitus were the diagnostic evidences of fracture of the femcral neck and were unmistakable. Recovery without more than one-half inch of shortening was secured in six weeks and remained permanent. Use of the limb was free, with slight if any impairment or discomfort after

FIG. 13.—Case 29, posterior view.

six months. Some eversion continued, however, to testify to the fact of a fracture of the femoral neck. She suffered severe pain at times in the early part of the treatment. No pain the last two weeks of the

FIG. 14.—Case 22, showing shortening of right femoral neck with no change in the vertical measurements from the lesser trochanter to the top of the femoral head. There is no shortening in vertical measurement because the neck stands more nearly vertical to the shaft.

treatment. Pain in early part of treatment was probably due to severity of other injuries at least in part.

Case 51, reported by Dr. W. M. Haggett, Nauvoo, Ill. Mr. U. K., aged eighty-five years, fell December 11, 1904, on the doorstep of his shop and fractured the neck of his left femur. The diagnosis of fracture of the femoral neck was positive because of crepitus, eversion, shortening, and severe pain with inability to move the limb. Fracture reduced and treated by the Maxwell method of longitudinal and lateral extension. From that time on he suffered no pain, and in four weeks the appliance was removed and he was able to be taken from his bed and sit in his chair. He occupied his chair and bed for three weeks longer, when he began to walk with the aid of his canes. For several years he had been afflicted with rheumatism, compelling him to use canes in walking. He now gets around as well as he did previous to the accident. Considering his age the result is very gratifying.

Case 52, treated and reported by C. E. Ruth, of Keokuk, Iowa. Mrs. B., aged seventy-four, a cripple for eight years by injury to the left knee, while on crutches fell and produced fracture of the right femoral neck, which was diagnosed under chloroform; this gave crepitus and rotation without the trochanter describing the arc of a circle. Eversion was complete. The amount of shortening could not be estimated, as the left leg from flexion and long disuse could not be used as a standard. She was treated four weeks by longitudinal and lateral extension by the Maxwell anatomic method, at which time union had taken place. At this time she took malarial fever and had a violent chill. She never recovered, and died from exhaustion two months later. Figs. 16 and 17 show the nature and extent of this injury, which was a fracture through the base of the neck splitting off the great trochanter and extending three inches below the lesser trochanter posteriorly. This case illustrates the impracticability of the plaster abduction adjustment and fixation.

I have received reports of about thirty more cases, but have not been able to get them in sufficient detail and completeness to embody in this paper.

FIG. 15.—Case 22. (See the *Journal of the American Medical Association*, Dec. 21, 1901—Ruth.) Slight eversion.

Cases in which there is marked eversion of the foot remaining or great shortening after union are due to imperfections in carrying out the technique. These cases have been reported from all parts of the United States; it is not the record of one treatment with the minimum of mechanical skill; but the better the method is understood the more nearly perfect the results will be. The report of Drs. Ochsner and Moore below exactly coincides with my findings and experience.

FIG. 16.—Case 52 in this report. Anterior view, showing separation of great trochanter and fracture running through beyond intertrochanteric line and illustrating the impossibility of effecting correction by the Whitman method. It is moreover impossible to differentiate this fracture with certainty from fracture of the narrow part of the neck.

man, but of many men. The mystery is not that some have secured almost perfect results with a fair degree of uniformity while others have been less successful; the marvel is that the results are generally so good. Although some can have had but little experience, this only proves the claim that any one can successfully apply the

In the original report of all these cases the name and address of the physician who treated the case may be found, so that any one may look them up for subsequent reference or verification.

To these fifty-two cases should be added sixteen reported by Dr. Ochsner, of Chicago, in the October, 1904, number of the

Annals of Surgery, pages 608-9, and four cases reported by Dr. Moore, of Minneapolis, in the *Northwestern Lancet* of March 18, 1904, making a total of seventy-two cases, with photographs of bone specimens received from six cases, which warrant the following summary and conclusions:

1. Cases between eighty and eighty-eight, 12.

2. Union with ability to walk well, 8.

3. Non-union (treated only four or five days), 2.

4. Paralysis preventing walking, 2.

5. Under eighty failure to secure union, none.

6. No failure to secure serviceable limbs in any case under seventy years so far reported, excluding cases in which treatment was abandoned inside of three weeks, death from intercurrent malady, or in which the injury is too recent to report. This gives serviceable limbs in one hundred per cent in cases under eighty years of age.

7. Percentage of success in patients over eighty years of age, sixty-six and two-thirds.

8. The mortality from this method is as

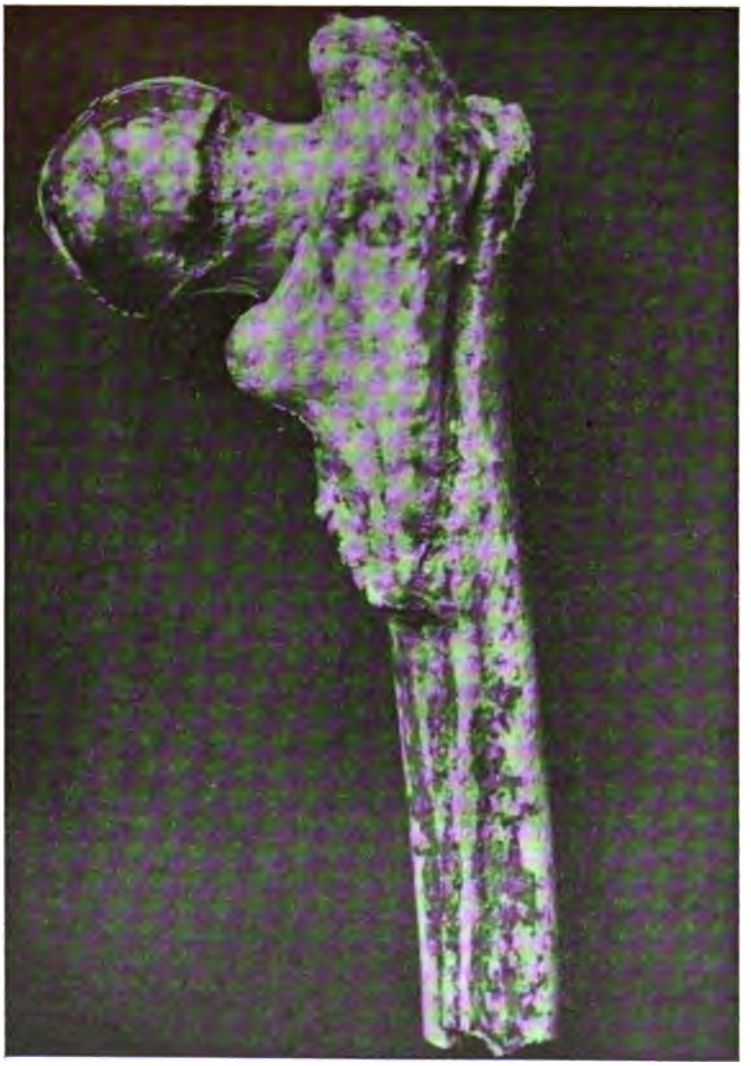

FIG. 17.—Case 52. Posterior view, showing separation of greater and lesser trochanters, intertrochanteric line and fragments extending three inches below the great trochanter. Abduction attempts at correction must only increase the displacement of the fragments. Union was secured in four weeks.

low as, if not lower than, that by any other plan of treatment.

9. Usually there is an entire freedom from pain, never any severe pain.

10. There is perfect immobilization of the fragments.

11. It is easy of application, with almost no expense for the dressing.

12. It can be applied by any one with the most rudimentary mechanical ability.

13. The method admits of change of position for rest, cleanliness, dressing, massage, and to relieve the tendency to hypostatic congestion.

14. Every part of the body is accessible as often as may be needed for any attention whatever.

15. The bedpan and urinal can be used with ease.

16. The sitting posture is attainable at any time and can be used as long as desired or indicated.

17. To this should be added absolute certainty of union if the patient lives and is treated four weeks.

18. It gives the greatest proportions of recoveries with the minimum of deformity or impairment of function.

19. It is applicable to every age and physical condition.

THE TREATMENT OF ARTHRITIS DEFORMANS.[1]

BY JOHN H. W. RHEIN, M.D.,
Neurologist to the Howard Hospital of Philadelphia.

What is known of the pathology of arthritis deformans does not help very much in suggesting any specific line of treatment. While the morbid anatomy has been well worked out, the etiology is more or less conjectural. The theory that the disease is of neuritic origin, which is supported by Sikes, Remak, Latham, J. K. Mitchell, and others, is not acceptable to most authorities. Of the other views held on the subject of the etiology of this disease, none is of sufficient weight to deserve consideration, excepting the theory that it is an infection. This was first defined by Schüller, who succeeded in isolating from the diseased joints a polar-staining bacillus. Ballantyne, Wohlmann, and Blaxall found a polar-staining bacillus in 24 out of 25 cases. Chauffard, Raymond, von Dungern, and Schneider found microörganisms in the fluid taken from the affected joints. This data is quoted from the paper by Aloysius O. J. Kelly, who looked upon arthritis deformans as an infectious trophoneurosis. Fayerweather studied three cases bacteriologically, and isolated organisms in each case. He concluded that cases of arthritis deformans were of undoubted bacteriologic origin. P. William Nathan divided these cases into two great classes: (1) Metabolic joint diseases of the arteriosclerotic and autotoxic forms; and (2) the infectious polyarthritic forms, basing his conclusions on a study of 200 cases.

It is claimed by the supporters of the bacteriologic theory that the character of the onset of the attack, which is sudden, the rise in temperature, the swelling, heat, and redness of the joints, the leucocytosis, the nervous symptoms, and the tachycardia, assumed to be due to toxins, the frequency of arthritis deformans as a sequel of infectious diseases, the occurrence of complications such as pneumonia, pericarditis, and the like, its polyarthritic character, and the presence of enlarged glands in the neighborhood of the diseased joint, all point to the infectious origin of the disease.

Before entering upon the discussion of the treatment of arthritis deformans, a clearer idea of the probable and possible effects of therapeusis will be had if the morbid anatomy of this disease is briefly reviewed. Walkhoff, of Königsberg, in 1905 gave an excellent appearance of the joints, based upon actual study of a number

[1]Read before the Camden County Medical Society, Dec. 11, 1906.

of cases, and quotes the work of Ziegler in 1877, and Kimura and Wolff. The heads of the bones became cone-shaped and flattened, and atrophic cysts were found in the spongiosa. In all his cases the cartilages were extensively destroyed, this change going hand-in-hand with the changes in the bones. When the cartilages were still preserved the subchondral bone was microscopically normal. The cartilages became softened and disintegrated, and a sclerotic change was seen in the subchondral layers, where the process was most extensive. Button-shaped prominences covered by degenerated cartilages were observed. The cartilages proliferated and small spiculæ therefrom filled the superficial medullary canals, and fibrous tissue, rich in cells, replaced the yellow marrow of the subchondral bone. Later in the process lacunæ were found in the bone, and these contained proliferated cartilaginous marrow, or fibrous medullary tissue. Papillary proliferations bordering the bone and bony laminæ were found in some cases. The superficial layer of the bony marrow was fibrous and vascular. Atrophy of the bone may take place, though he disagrees with Kimura's opinion that the genesis of the arthritis is a bone atrophy. In a word, the joints become extensively diseased, the cartilages undergoing degeneration, as well as the bony part of the joint, associated with atrophy of the bone, and the formation of osteophytes. The synovial membrane also becomes thickened and diseased. There may be finally ankylosis of the joints, which, however, is not a true ankylosis, but due to the formation of osteophytes and the thickened ligaments.

The treatment of this affection may be conveniently taken up under three headings, namely: (1) Measures directed toward preventing the progress of the disease itself; (2) to relieve the pain; (3) to correct the deformities. At the start-off great difficulty is encountered in gaining the coöperation of the patient in a treatment which must necessarily be systematically carried out for many months. Herein lies the key-note of the success of the treatment. The disease is a slowly progressive one, and it is equally slow, in most cases, to respond to any great extent to the treatment. Failure to relieve the symptoms at an early period becomes discouraging to the patient, and it is with difficulty that he can be persuaded to proceed with the treatment in the face of apparently no improvement. If, however, this difficulty can be overcome, and the patient induced to remain under the proper regimen for months, or even years, the results will be most encouraging. Measures directed to improve the general health and nutrition are highly important. General hygienic measures require especial attention. An outdoor life, alternating with periods of rest in the recumbent posture, carefully regulated exercises, and an equable, dry climate, are important features of the treatment. The digestion must be carefully watched, and the diet should be nutritive, including eggs, meats, milk, sweets in moderation, fruits, and if desired and indicated alcoholic stimulants. All drugs upsetting the digestion, or having a depressing influence upon the general system, should be avoided. The antirheumatic diet is contraindicated. I have seen such a restriction of diet followed by an exacerbation of the symptoms, and a general lowering of the vitality of the patient.

Hydrotherapy has been recommended, such as is obtained at Aix-les-Bains, the hot springs of this country, and elsewhere, but this should be taken with great caution, and discontinued if the effect is to weaken the patient. Mud-baths have also been suggested (Sikes).

The underclothing should be made of woolen, and so regulated that the changes in the temperature and moisture should have a minimum effect upon the bodily temperature. The joints should be surrounded by flannel bandages, and these should be covered with rubber cloth in such a way as to exclude the influence of atmospheric changes.

I wish now to direct your attention to what I consider of paramount importance in the treatment of this disease, namely,

the persistent use of galvanism and massage. When these are properly employed daily for months and years, in association with the general measures described in this paper, I believe they have a marked influence upon the course of the disease, and may in some cases effect a cure.

Galvanism should be applied with large pads, passing the current through the joints, and using as much electricity as the patient can bear. The current should be applied for a period of five minutes to each joint, and the treatment should be given daily.

General massage should be given once a day, and local massage again at some other time of each day. I have under my care at present two cases which have been vastly improved under this regimen. One is a woman of seventy-two years, who had been practically incapacitated for a year, and had not left her room during that time. The treatment was continued for nine months before much improvement was noticed. Massage and electricity always temporarily relieved the pain and stiffness, but it was not until the end of nine months that the patient began to walk. After this the improvement was more rapid, and at the end of three more months she was able to go out and to walk without support, and now, a year later, she can walk eight or ten squares without pain, and the joints which had previously been affected have lost much of their deformity and are practically painless.

The second case, a young woman of twenty-eight, came under my care about a year after the onset of the disease. The joints of the hands and toes were involved so that any motion of these joints caused great pain, and there was considerable deformity in the joints. Walking more than a square was out of the question on account of the pain in the feet. Three months after the treatment was instituted the patient reported that she was able to walk several squares without causing pain in her feet, and that pain was practically absent in the hands, while the deformity was almost *nil*.

I have under my observation at present at the Philadelphia Home for Incurables, 19 cases of rheumatoid arthritis in which I have studied the effect of certain drugs upon the pain. In nine of these cases the salicylates afforded temporary relief. In three cases cannabis indica was effective. In nine cases phenacetine gave the best results. In one case nothing but oil of gaultheria gave any relief. The salicylates and phenacetine failed to help in 10 of the 19 cases. In five cases cannabis indica was of no value whatever. Opium is actually the most satisfactory drug in these cases, but should only be employed when all other measures fail. It must be remembered that in a disease which is as chronic in its course as arthritis deformans the danger of establishing the habit is great. In one case the combination of phenacetine, cannabis indica, and small doses of codeine had a magic effect upon the pains, and it never became at any time necessary to increase the dose of the codeine.

In some of the cases at the Home the pain was slight. In seven cases the pain was moderately severe; in five it was very severe. In two cases the pain had been severe from the onset of the disease; in eleven cases it had decreased; and in six cases it had grown progressively worse.

The distribution of the pain was irregular. In nine cases it was general; in three cases it was confined to the arms and hands; in one to the left hip; in one to the shoulder; in one to the left elbow; in one to the arms; in one to the calves of the legs; in one to the soles of the feet; and in one to the ankles and elbows.

In 14 of the 19 cases the pain was much influenced by the weather. In six cases the pain was worse at night; in six worse in the morning; and in seven cases there was no relation to the time of day.

The prescription which I have found most useful in stimulating the digestion is a combination of strychnine, nitromuriatic acid, pepsin, tincture of cardamom comp., and infusion of gentian comp. The bowels should be kept regular. Insomnia should

be combated by the usual methods. In a word, the whole treatment, other than indicated above, should be symptomatic.

The high-frequency current has been recommended by some electrotherapeutists, and while my experience with this form of electricity has been limited, I have never been convinced of the advisability of employing it.

Finally, let me briefly refer to the value of the vibratory treatment for the relief of the pain, and Swedish movements for the stimulation of the wasted muscles, and the combating of the stiffness and deformity.

I take this opportunity of thanking Dr. H. G. Meiman, of the Philadelphia Home for Incurables, for his assistance in studying the cases at that institution.

A NEW SUBSTITUTE FOR IODOFORM.

BY JAMES H. FORD, PH.C., M.D., INDIANAPOLIS, IND.,

Professor of Surgery in the State College of Physicians and Surgeons (Medical Department of Indiana State University); Chief Surgeon to the Big Four Railway; Surgeon to the Indianapolis City Hospital, St. Vincent Hospital, and State College Hospital.

Formerly I employed a good deal of iodoform in my surgical practice, but owing to its numerous disadvantages had long since abandoned it, although I regretted the necessity for so doing, as iodoform has proved of value in many cases.

Something over a year ago I received a quantity of a new synthetic preparation, composed chiefly of salicylic acid, formaldehyde, and iodine, which was sent to me for experimental purposes, as it was not on the market. This was provisionally called formidine.

Chemically, formidine is designated a condensation product of iodine, formaldehyde, and salicylic acid, having the formula $C_{15}H_{10}O_2I_6$, or it may be called an iodized derivative of formaldehyde and salicylic acid. It is a true chemical compound (methylene disalicylic acid iodide), exhibiting none of the physical characteristics, nor responding to any of the chemical tests for its constituent bodies until decomposed.

Formidine is a reddish-yellow powder, tasteless, and having a slight but not disagreeable odor suggestive of iodine. It is perfectly stable in the dry state, and contains about fifty per cent of iodine in loose combination. When heated, iodine is liberated, the substance melts, then chars, and is finally consumed without leaving any ash. It is insoluble in water, dilute acids, alcohol, and most other ordinary solvents. When brought in contact with alkaline organic secretions it slowly dissolves and develops the characteristics of its constituents, iodine, salicylic acid, and formaldehyde, and then evinces its germicidal power.

When taken internally, formidine breaks down, as above indicated, and iodine, formaldehyde, and salicylic acid are eliminated by the kidneys, as I am informed has been determined by their presence in the urine of animals so experimented upon.

CASE I was a man from the tropics who had become infected and had been treated in a New York hospital for a large perineal abscess, which was opened and drained with apparent recovery. He entered my service in the hospital suffering from a large excavating abscess on the inner aspect of the right thigh, involving Scarpa's triangle. There were also infected inguinal glands. The glands were opened, curetted, and the wounds packed with formidine powder. The abscess in the thigh was opened and more than a pint of foul pus evacuated. Through-and-through drainage was instituted and the abscess cavity washed out with ten-per-cent glycerin emulsion of formidine for a few days, and afterward large quantities of formidine powder were blown into the cavity. The odor promptly disappeared, the pus became thin and soon afterward ceased to form, and the wounds promptly healed by granulation. The results in this case were very satisfactory.

There was no staining of the clothing or dressings, and no irritation due to the drug.

CASE II.—A man fell to my charge in the hospital with an infected knee-joint with metastatic abscess behind the right trochanter. The knee-joint was treated with formidine emulsion and the trochanteric abscess opened and a large quantity of foul-smelling pus evacuated. This was also disinfected with formidine-glycerin emulsion and afterward with the formidine powder. The man made a prompt recovery without any complications.

I have used formidine in a large number of cases, many of them being minor surgical cases—lacerated or contused fingers, hands, toes, or feet, so commonly seen in railroad employees. Many other cases have been seen consisting of abscesses, and these have been treated by free opening and drainage. I have instructed my assistants to irrigate thoroughly with physiological salt solution to avoid coagulation of albumen, as happens so frequently in using antiseptic solutions, especially those of acid reaction. I then have prepared an emulsion or suspension of formidine in distilled water, and this is forced into the cavity, using it in the same manner as I would any other irrigating fluid.

My experience with this chemical agent, in the form both of an irrigating fluid and a dusting powder, has been very satisfactory. No odor has been observed to be generated, such as was formerly so objectionable when iodoform was used. There was no staining of the dressings or tissues. I have noticed, however, that the formidine does become dark in color and is unsightly, but this is of minor moment. There has been no irritation of the tissues at all; no iodoform dermatitis and no pain caused by its use. Some few patients have complained of a hot feeling or a burning sensation for a few minutes, but this invariably passed away promptly and has given no trouble.

NEWTON-CLAYPOOL BUILDING.

THE THERAPEUTIC VALUE OF ARHOVIN.

BY ERNST R. W. FRANK, M.D., BERLIN.

The popularity that the treatment of gonorrhea with internal remedies has enjoyed, and still enjoys, proves that despite the noteworthy advances that the therapy of the disease has made not sufficient attention is given to anatomicophysiological and bacteriological facts. If one reviews the literature of the internal agents that have been introduced within the last few years, one meets with the same uniformity in the various articles. The authors are usually content to report on a greater or less number of simple or complex cases of gonorrhea that they have treated with a particular remedy, at times with and at times without success. Unconsciously the insufficiency of these remedies is frequently demonstrated through the statement that in addition to the internal, local treatment also had been employed. It must be apparent that these purely casuistic reports cannot bring about a true appreciation of the real value of the remedy in question, as long as the anatomicopathological and bacteriological relations, which differ in almost every case, have not been adequately considered.

By reason of the peculiar structure of the urethral mucosa, the internal treatment of gonorrhea has limits beyond which no internal remedy, be it never so bactericidal, can produce any effect. Again and again reference is made in literature to the three well-known observations of Ricord,[1] which he has published in his "Lettres sur la syphilis." Three gonorrheal patients treated with balsam copaiba had fistulas just above the penoscrotal angle produced by artificial constriction of the penis in the seventh or eighth year of life. The gonorrheal process subsided up to the fistula—that is, as far as the urine impregnated

[1] Ph. Ricord: Lettres sur la syphilis, Paris, 1891, pp. 135-143. Also Iconographie de l'hôpital des vénériens and *Bulletin de l'Académie impériale de médecine*, 1849, xiv, p. 593.

with the decomposition products of the remedy named came in contact with the mucosa. The section distal to the fistula, comprising the middle and upper thirds, remained diseased, and was only cured by local treatment. It is the mucosa of just these portions of the anterior urethra that is characterized by its richness in lacunæ and crypts, and it is upon this fact that the chief cause of the therapeutic failure of Ricord's cases depended.

The bacteriological investigations made in recent years with sandalwood oil—to be mentioned further on—have shown that this oil does not possess a gonococcicidal action, and this is probably true also of copaiba balsam and the other balsamics. The real cause of the inadequacy of every treatment of gonorrhea rests on anatomical grounds.

Especially in its anterior section the urethral mucosa contains, in addition to Littre's glands, the so-called lacunæ and crypts of Morgagni. These latter, differing markedly in their number and size, represent pocket-like depressions in the mucosa, and embryologically are to be looked upon as epithelial invaginations. They penetrate the mucosa obliquely, and in such a fashion that they make an acute angle with the inner surface of the mucosa, opening toward the meatus.

The direction corresponds to the urinary stream, so that in passing the urine can never enter into the crypts, but rather closes them. This is in accordance with the physiological significance of the pockets, the mucosa of which contains numerous minute mucous glands, by the secretion of which the mucosa is kept moist and slippery.

It may be mentioned incidentally that some of the Littre glands frequently empty into the lacunæ. Gonococci advance from the fossa navicularis, penetrate into these pockets, and find there an especially favorable environment. Internal remedies can only unfold their activity when, dissolved in the urine, they reach the diseased parts. It must be evident that the bacteria in the depths of the lacunæ and crypts cannot be influenced by such remedies, since the urine does not find its way into these structures. It must, therefore, be definitely accepted that even with the best internal remedies, gonorrheal processes cannot be effectually attacked because the principal seats of the bacteria are closed to the remedy.

Moreover, the bactericidal power of the medicaments in question is often overestimated. As far back as 1895 Valentine[1] demonstrated by experiments that it is not possible to influence the growth of gonococci and other bacteria of the urethral flora when in the preparation of urine-agar plates sandalwood oil urine is used.

I want here to report a case that seems to illustrate these points. In 1900 I was consulted by Mr. D., who had acquired his first gonorrheal infection four years previously. After six months of ineffectual treatment with various injections the patient consulted a well-known clinician, who advised him to stop all local treatment and to drink large quantities of water, and to take sandalwood oil. Within a period of four months the patient took 600 capsules of oleum santali and drank as much as twelve quarts of water per day. He was dismissed cured. Two weeks later, no coitus having taken place, the discharge returned, in which gonococci could be demonstrated. During the succeeding years the patient was treated by a number of physicians, some of whom declared him sound; others treated him with injections, suppositories, and soft bougies. His condition became steadily worse. I found four years after the infection, in addition to two distinct urethral strictures, a large focus in the prostate gland, the expressed secretion of which showed gonococci verified by cultures.

The patient was discharged cured after proper treatment; he is married, and has healthy children. Such failures from purely internal treatment I have seen quite often. They are in accordance with anatomic facts.

Some time ago I received from the

[1] Ferd. C. Valentine, New York: Der Einfluss des Ol. Santali auf das Bakterien-Wachstum, insbesonders auf die Gonococcen. *Arch. für Dermatologie und Syphilis*, Bd. xxxii, 1895, p. 169.

Chemical Institute of Dr. Horowitz, Berlin, a new preparation—arhovin,[1] for which great value in the internal treatment of gonorrhea, and as a urinary antiseptic, was claimed. Arhovin is not a balsamic, but an addition product of diphenylamin and the ester of thymyl-benzoic acid; an aromatic liquid, with a specific gravity of 1055, of feebly cool, burning taste, on account of which the remedy can only be taken in capsules. While the two constituent bodies, since they are not indifferent, cannot be used therapeutically, their addition product (arhovin) is wholly non-poisonous, though not inferior in antiseptic power to either of them. It is insoluble in water, but easily soluble in alcohol, ether, chloroform, and oil. It is absorbed in the stomach in from fifteen to twenty minutes, as can be demonstrated by the green coloration developed when a one-per-cent chloride of iron solution is added to the urine. This reaction probably depends on the presence of a phenyl-hippuric acid. The thymol is changed into thymol-glycuronic acid.

Bacteriological investigations of the remedy have been made by Burchardt and Schlockow[2] and by Piorkowski.[3] These authors state that the decomposition products of arhovin are capable, even in cases of alkaline or ammoniacal fermentation, of producing an acid reaction in the urine. Burchardt and Schlockow found that the arhovin-urine possesses strong inhibitory influence on the growth of bacteria, and that it is capable of arresting the development of pure cultures entirely; and in drinking-water containing large numbers of bacteria to interrupt at once all further growth. The undecomposed arhovin, the authors state, possesses antibacterial power in a lesser degree, because it is insoluble in water. Piorkowski, by allowing arhovin to act in substance and in oily solutions on colon, staphylococcus, and streptococcus cultures, noted an inhibitory influence. Arhovin oil in contact with gonococcus cultures caused their death in from one to two hours.

I have had Dr. Heilman, of Pittsburgh, conduct a series of experiments, which have led to the results detailed below.

Cultures were made from fresh gonorrheal pus on human blood-serum agar as well as on ascites bouillon. With due reference to natural conditions, persons who had never been infected with gonorrhea received arhovin. One or two hours after the ingestion of from six to eight capsules of arhovin (0.25 g.) per day the urine was collected under antiseptic precautions. Only urine from individuals whose urinary tract had always been normal was used for the experiment in order to exclude bacterial contamination.

1. Ascites-agar was inoculated with gonococci: After twenty-four hours, abundant growth. (Control.)

2. Ascites-agar was inoculated with gonococci from the same cultures and sterile, ordinary urine poured over: After twenty-four to forty-eight hours, no growth of gonococci; but development of diplococci arranged in chains and not staining by Gram.

3. Similar experiment, arhovin-urine being poured over cultures: No gonorrheal growth; development of diplococci arranged in chains and not staining by Gram.

4. Ascites-bouillon inoculated with gonococci: After twenty-four hours, abundant growth. (Control.)

5. Ascites-bouillon inoculated with gonococci, an equal amount of ordinary urine being added: After twenty-four to forty-eight hours, no growth.

6. Similar experiment, arhovin-urine being used: After twenty-four to forty-eight hours, no growth.

7. Ten cubic centimeters of arhovin-urine were left twenty-four hours in the incubator at 37° C.: After twenty-four hours, sterile; after forty-eight hours, slight growth of bacteria and cocci.

8. Sterile urine was similarly treated: After twenty-four to forty-eight hours it was still sterile.

[1] Arhovin may be obtained from Kaiser-Friedrich-Apotheke, Berlin.

[2] Burchardt u. Schlockow: Arhovin, ein neues innerliches Antigonorrhoikum. *Med. Woch.*, No. 48, 1903.

[3] Piorkowski: Ueber Arhovin. *Dtsch. med. Woch.*, 1905, No. 25.

9. Arhovin-urine was inoculated with staphylococci: After twenty-four hours, abundant growth.

10. Sterile urine inoculated with staphylococci: After twenty-four hours, abundant growth.

For purposes of control, all experiments were conducted in duplicate or in larger series. They showed that the decomposition products of arhovin, although not able to render the urine strongly bactericidal, give to it inhibitory properties with regard to streptococci and staphylococci; gonococcus cultures were arrested in their development. As, however, on account of their exceedingly great sensitiveness, such cultures are inhibited even by sterile urine, these experiments cannot be considered as proof of the value of arhovin. It must, nevertheless, be said that the results of experimental culture tests are not always identical with the results obtained in practice. The increased acidity of the urine under the administration of arhovin might be unfavorable for the growth of gonococci in the urethra. Moreover, other still unknown physiologicochemical factors might play a part. We have, for example, despite numerous and careful investigations (I refer to those of L. Levin,[1] J. Varges,[2] H. Vieth u. a.[3]) as yet no definite unequivocal conception of the disinfecting properties of the balsamics. The foregoing experiments simply show that arhovin, as well as other internal remedies, does not render local antisepsis superfluous in the destruction of the gonococcus. We must still have recourse to the silver-albumin preparations, the most efficient of which is albargin.

Arhovin, however, will be welcome even more than the balsamics, by reason of its sedative analgesic action on the inflamed mucosa of the urinary tract. I have had no personal experience with the local use of arhovin oil. Several authorities, however, report good results in cervical catarrh and endometritis of gonorrheal origin. Piorkowski has had good antibacterial results with pure arhovin and with a two- or three-per-cent solution in oil. After thirty minutes the arhovin checked the development of staphylococci and colon bacteria in bouillon cultures; and after sixty minutes the bacteria were killed. When arhovin-oil was brought in contact with pus containing gonococci no growth could be obtained on blood-serum-agar plates. Control experiments with pure oil are, however, needed.

All known balsamic agents employed in the internal treatment of gonorrhea have the disadvantage of producing irritation in the gastrointestinal canal and upon the kidneys; even sandalwood oil is not free from such an action. I have lately seen especially disagreeable symptoms of irritation in the digestive organs under the use of gonosan. The patients complained of epigastric pain, nausea, or other disturbance of the appetite and digestion. On the other hand, even after the continued administration of arhovin in a considerable number of cases, I have never heard the slightest complaint, nor have I noticed any signs of irritation. Not infrequently patients have pointed out to me that while during previous attacks of gonorrhea they had suffered from digestive disorders after taking balsamics, they did not experience the least distress after taking arhovin, even when the dose reached from 10 to 12 capsules, each 0.25 g. per day, for three or four days in succession. The sulphosalicylic acid test did not show the slightest trace of albumin in the urine.

I have also found, in common with others, that in cases of gonorrhea or other bacterial infections of the urinary passages, the irritating symptoms are greatly lessened, if not entirely banished, by arhovin, a fact that could be demonstrated with particular clearness in inflammatory processes in the posterior urethra and the neck of the bladder. I therefore look upon arhovin as a useful agent in the treatment of inflammatory, and especially gonorrheal, diseases of the urinary tract.

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[1] L. Levin, cit. in 2.

[2] J. Varges: Zur Kenntnis des Gonococcenharns. *Med. Klinik.*, 1905.

[3] H. Vieth: Ueber die Wirkungsweise der Balsamica. *Med. Klinik.*, 1905, No. 50.

SPECIFIC MEDICATION IN THE TREATMENT OF TUBERCULOSIS.

BY JAMES SAWYER, M.D., ASHEVILLE, N. C.

A little over two years ago (October, 1904), under the caption of "The Use of Specific Products of Tubercle Bacilli in the Treatment of Tuberculosis," I reported fourteen early-stage cases of pulmonary tuberculosis treated with the watery extract of tubercle bacilli, and all of them were at that time apparently cured and in good health. To-day, two to eight years after their discharge, they are all still living and well, except Case 3, which was discharged as apparently cured September 21, 1900. In this case death resulted last winter, over five years after his discharge, when in apparently good health. After exposure the patient contracted pneumonia, and died after an illness of about six weeks. To what extent the previous pulmonary tuberculosis may have contributed to the unfavorable course of the pneumonia I am unable to say, there having been no autopsy. Since this report I have treated and discharged thirty-eight other cases of early tuberculosis, all of which were treated with the watery extract, and all have apparently gotten well and remain so at the present date.

The good results obtained are due to a great extent to a very careful selection of the cases so treated, as none but early-stage cases were accepted, except a few trial cases to be mentioned later. In each instance the diagnosis was verified by either the tuberculin test, the presence of tubercle bacilli in the sputum, or sufficiently pronounced physical signs, as well as by the history of the case. I have no doubt that the results would have been different if far-advanced cases had been accepted for treatment.

In common with others who are treating tuberculosis, I am endeavoring to discover and use the best method, or combination of methods, of treatment. Therefore I give my patients the advantage of all other aids that are of value in the individual case, and hence it will be understood that the watery extract is not the only thing that has been used in the treatment of these cases. The usual hygienic, dietetic, climatic, and other methods suitable to each case were used as indicated, but the watery extract was employed in every instance, and to it I attribute certain of the good results.

The uniform favorable results in my cases have been a source of constant surprise to me, and as to the demonstration of the value of the method of treatment employed I fear a skeptical attitude by colleagues who have not given it a painstaking trial, and who even then may have had a less favorable experience if they have not also confined their application of it to the favorable early-stage cases as I have done. However this may be, I can but state my results as they are; yet I wish to again call your attention to the class of cases which I subjected to this method, in which the exclusion of advanced and exhausted cases of phthisis has no doubt had a great influence. Not only have I excluded such cases, but as far as I could determine I have tried to also exclude cases which, although as yet showing no cavities or massive caseous pneumonias and necrotic changes, have by the presence of high fever and corresponding general decline indicated a rapidly unfavorable course.

For uniform results such a selection is absolutely essential, if, as we believe, the action of specific bacterial products depends upon the production of an increase of resistance—call it immunity if you like—on the part of the organism, through the formation of specific substances in the blood antagonistic to these bacteria and to their products. That such specific products form also in tuberculosis naturally, especially in cases that pursue a favorable course, and that these can be increased artificially through the introduction of specific products of the tubercle bacillus, seems well established by the experimental work of Drs. Koch, Wright and Douglas, and Maragliano, and by others who through the immunization of animals have endeavored to

obtain a serum for passive antitoxic or antibacterial immunization of the tuberculous human subject.

It is only in a limited number of cases that I have been able to make necessary blood tests, and so far they have only extended to the production of agglutinins and their increase during treatment with the watery extract. These examinations, though few in numbers, have, however, in every instance showed a decided increase from time to time as the treatment progressed, and most gratifying clinically was the observation that the increase stood in relation to the general and local improvement of the patient, the latter manifesting itself in retrograde changes in the tuberculous areas, which in the end reached a degree that almost without exception all abnormal auscultatory and percussion signs had disappeared.

A like satisfactory improvement occurred in subjective symptoms. Elevation of temperature gradually subsided, the patient's appearance grew better, there was gain in weight, night sweats when present ceased, and the cough and expectoration likewise became less marked until they stopped entirely. Tubercle bacilli disappeared from the sputum. All patients regained a state of general health equal to, and sometimes exceeding, that which they enjoyed before their illness.

Within the past few years I have made a trial with the remedy in a few of the more advanced cases of phthisis. I have, however, selected only those which showed no marked complications, and in which the general condition of the patient was fair enough to justify the expectation of improvement. These cases appear to me to be of more than passing interest, and that you may have a better understanding of their condition on admission to the treatment it may be permissible to report with some details.

CASE I.—J. W. K., aged thirty-two, male. Practically the whole of the left lung was involved, also right apex. There was a cavity in the lower portion of the left upper lobe anteriorly. Pulse was rapid, but not weak, and the temperature ran up to 101° F. His general condition was fair. He came under my care May 1, 1902. He had a left-sided pleurisy early in June, which lasted about two weeks. The use of the watery extract was begun June 26, about which time an ischiorectal abscess developed, which was operated on at once and promptly healed, after which he began to improve. For financial reasons he discontinued the watery extract August 30, after which his condition remained about the same for several months, but his temperature then began to go up and his weight to decrease. On January 6, 1903, the use of the watery extract was resumed, and he began to improve almost immediately, gaining in weight, strength, and general condition. He continued under the watery extract until June 9, 1903, when his condi tion was so good he decided that he could safely stop it. His improvement still continued, though he lost a little weight during the summer months. For several months thereafter he continued to be in about the same condition, with the usual ups and downs, until January 24, 1904, when, from useless and very foolish exposure, he came down with a very severe double pneumonia, which overcame him January 27. The special point of interest in this case is that while he was taking the extract he improved, and his improvement held foi several months in each instance after discontinuing it, and though he was under exactly the same treatment all the time he improved only while he was under the influence of the watery extract.

CASE II.—A. P., aged twenty-eight, female. Both upper lobes and the left lower lobe were involved, with a cavity in the left upper lobe anteriorly. The temperature went to 101.5° F., the pulse was rapid; she was very nervous and worried about family matters, and her general condition was only fair. She began the watery extract July 4, 1904. Her improvement was slow but constant, and she was discharged December 27, 1905, with her lungs perfectly clear, excepting the left upper lobe, which is the seat of a small, dry cavity. The remarkable

thing in this case is the continued improvement in spite of many unusual worries and trials which happened to fall to her lot. This patient's home is in Asheville, and she is still free from tuberculosis.

CASE III.—F. E. C., aged nineteen, female. The right upper and left lower lobes were involved, with a cavity in the upper part of the left lower lobe posteriorly. On admission her temperature was 101.6° F., her pulse 90 to 98, and her general condition good, save for the absence of her menses for several months and the spitting of blood occasionally. She began the watery extract November 17, 1904, and there was a rapid gain in weight and strength, but the menses continued absent. Local examination was advised and revealed a diseased right ovary. An operation was permitted and performed May 8, 1905. The operation revealed a cystic degeneration of the right ovary and tubercles in the right tube. The ovary and tube were removed; the patient did well, menstruated a month or so later, and continued to do so regularly thereafter. The patient was taking the watery extract all this time, and continued with it until a short time before her discharge, April 6, 1906, when her lungs had cleared up and her condition was better than at any time in her life. She is now at home and enjoying excellent health. How much the operation contributed to the recovery in this case it is impossible to say, though I believe it had a very marked influence upon the course of the disease, and realize that the patient could have hardly recovered without it.

A few other cases similar to these I have still under treatment. Clinically the discharged cases could really be designated as apparently cured, but as we all know the tendency to relapse, to recurrence of secretions in cavities, and reappearance of tubercle bacilli at such times, I shall only say that they are apparently arrested, and I shall not fail to give you a further account of their progress when I shall have occasion to speak again on this subject.

The final test of any method of treatment is not the immediate percentage of cases discharged as apparently cured or arrested, but the endurance of the results that have been attained. In this respect I have likewise reason to be satisfied. Judging from the fourteen cases reported in 1904, and from these later cases, I am led to believe that the cures effected by the watery extract are more permanent and certain than those by any other method, though the number of my cases is still too small and the time of the discharge of the majority of them is too recent to make this statement as final. However, I believe time will prove that in a great majority of the cases so treated the permanency of the cures is real, the results abiding.

I consider the remedy perfectly safe in the hands of an experienced and careful practitioner, and personally I have never had occasion to attribute any unfavorable effects or symptoms to its use. Undoubtedly large doses, improperly used, especially in the beginning of the treatment, may cause reactions somewhat similar to those of tuberculin, but it is much safer than tuberculin, is not cumulative in its action, and it is not likely to cause a reaction when given in therapeutic doses. I have never had a reaction in any case which was being treated by it, but in a very few cases I have used it as a test instead of tuberculin and have obtained prompt reactions therefrom.

It is my unbiased opinion that in the watery extract, taken together with the usual hygienic, dietetic, climatic, and other methods of treatment generally used, we have the best and safest method of treating tuberculosis yet advanced. As above noted, I consider it much more valuable in the early-stage cases, though my experience teaches me that it is also valuable in certain selected advanced cases; and to this extent I recommend it.

This experience I believe justifies me in the belief that in the early-stage cases of chronic pulmonary tuberculosis a cure can be accomplished as a rule by specific treatment combined with the usual methods; and as to the preparation of the specific product of the tubercle bacillus to be used, I naturally prefer the one with which I have become familiar, and from the use of which I have seen nothing but good results.

THE TREATMENT OF CORYZA.

BY E. S. McKEE, M.D., CINCINNATI, OHIO.

This complaint occurs most frequently in the changes of the seasons, spring and fall, but to some extent is with us always, and is one of the most frequent conditions which we are called to treat. The disease probably depends upon a microörganism, though it seems in some cases to be caused by irritation, as from the fumes of certain drugs or dust. Most cases, however, have the appearance of contagion or occur as an epidemic. Persons who eat heartily of animal food and do not take sufficient exercise, live in superheated atmospheres, breathe foul air, and wear too heavy clothing are subject to coryza.

Treatment.—Spray once daily with an alkaline and antiseptic solution, then one-per-cent solution of cocaine with .40 per cent of boracic acid. In five minutes use a two-per-cent spray of antipyrin, and five minutes later insufflate with calomel; lastly, one per cent of menthol in liquid vaselin should be sprayed in the nose.

Among a host of sprays for coryza are the following:

℞ Mentholis, 0.50;
Camphoræ, 0.30;
Liq. petrolati, 30.00.

℞ Cocainæ hydrochl., 0.30;
Mentholis, 12.00;
Camphoræ, 12.00;
Liq. alboleni, 30.00;
Resorcini, 0.30.

M. S.: Spray several times daily.

Adrenalin chloride (1:1000), 4.00;
Cocaine hydrochlorate, 0.60;
.8 per cent salt solution, 60.00.

M. S.: Use as spray two or three times daily, patient lying down a few minutes after using the spray to facilitate the medicine running back into the nose. Patient should remain indoors for some time after this.

℞ Sodii salicylati,
Sodii chloridi,
Sodii bicarb., ää ad 100.00.

M. S.: Teaspoonful in one-half pint of water and use as a spray.

℞ Hydrogenii peroxidi, 30.00;
Hydrarg. bichloridi, 0.05;
Zinci sulphocarbolatis, 1.33;
Aquæ destillat., q. s. ad 130.00.

M. S.: Spray after cleansing.

As a stimulant to the mucous membranes:

℞ Thymolis, 0.02;
Ol. caryophylli, 0.18;
Liq. petrolati, 30.00.

M. S.: To be sprayed in the nares two or three times a day.

℞ Acidi carbolici,
Mentholis, ää 0.06;
Ol. gaultheriæ, 0.06;
Liq. petrolati, f℥j.

M. S.: Use as a spray three or four times a day where an antiseptic is needed.

As a sedative use the following:

℞ Mentholis, 0.06;
Cocainæ, 0.18;
Liq. petrolati, 30.00.

M. S.: Spray two or three times a day.

℞ Ol. caryophylli, 0.50;
Terebini, 0.70;
Liq. petrolati, 30.00.

M. S.: Spray.

℞ Olei cassiæ, 0.12;
Mentholis, 0.15;
Liq. petrolati, 30.00.

M. S.: Spray.

The proper treatment in most cases is to first spray with an alkaline solution for cleansing purposes, then with the curative solution, and follow this with a soothing remedy dissolved in oil.

Snuffing of liquids of an alkaline and antiseptic character, such as are made by dissolving Seiler's or Thrasher's tablets in water, is quite beneficial. A simple alkaline and antiseptic wash which can be made up at home is the following: Salt, one-half teaspoonful; soda, one teaspoonful; carbolic acid, ten drops; in one pint of water. This is best used lukewarm, the patient stooping over and snuffing it through the nose and spitting it out of the mouth. If snuffed through the nose in the erect posture or with the head thrown backward there is greater danger of the solution passing through the Eustachian tubes into the ear and causing trouble. These alkaline solutions, if used regularly in flushing out the nares, are very beneficial to prevent coryza. Another is equal parts of salt, borax, and bicarbonate of soda, one teaspoonful to a

pint of water, used lukewarm. The addition of a little carmine to these solutions makes them look less simple and seems to produce a good effect on the patient's mind. The fluidextract of hamamelis snuffed from the hand every two hours is valuable. Snuffing of powders in coryza has come to be looked upon with suspicion by many because it has been used so much for the exhibition of cocaine. However true this may be, yet an honestly made snuff for coryza and catarrh does much good. The following has been tried and not found wanting:

℞ Acidi boracici, 1.00;
Thymolis iodid., 1.00;
Bismuth. salicylatis, 1.00;
Sodii chloridi, 10.00;
Powdered elm, 50.00.

All should be very finely powdered and intimately mixed by trituration, and if necessary to render it light and fluffy it should be sifted through bolting cloth.

Another good one:

Menthol, 0.05;
Thymol, 0.05;
Eucalyptol, 0.05;
Orris root, 6.00;
Sodium chloride, 6.00;
Powdered elm, 50.00;
Hydrastine hydrochloride, 4.00.

Prepare like the preceding.

Pain and smarting in the nares can be relieved by something like Ferrier's snuff:

℞ Morphinæ hydrochloridi, 0.12;
Pulv. acaciæ, 8.00;
Bismuthii subcarb., 0.25.

A little of this may be insufflated every few hours.

As most of the sneezing in coryza comes from postnasal irritation, it is well to insufflate into this region an anesthetizing powder:

Orthoform, 2.00;
Soziodolate of soda, 10 parts.

Ointments are very much used for coryza and are quite useful. They are most convenient in collapsible tubes. Following is a good formula:

℞ Eucalyptolis, 1.00;
Mentholis, 4.00;
Petrolati albi, 75.00.

Dissolve the menthol in the petrolatum, taking care not to have the heat too high, and when nearly cold incorporate the eucalyptol. This may require to be diluted in some exceptional cases.

Adrenalin is being used quite a good deal in nasal troubles, and seems to act well in ointment, as the effect is kept up longer. Following is a good ointment:

Adrenalin chloride, 0.03;
Normal salt solution, q. s. ad 16.00;
Hydrous wool-fat, 16.00;
White petrolatum, 18.00.

Dissolve the adrenalin chloride in a few cubic centimeters of normal salt solution and incorporate with the lanolin previously melted and allowed to become nearly cold. Finally add the petrolatum and mix well.

This ointment is the same strength as the 1:1000 solution and should be reduced to one-half by the addition of petrolatum in most cases.

Another useful formula:

℞ Thymolis iodidi, 0.65;
Phenolis, 0.33;
Camphoris, 0.65;
Petrolati, q. s. ad 30.00.

Melt the phenol, and in it dissolve the camphor. Melt the petrolatum, and in it dissolve the aristol. Finally mix the two solutions and allow to cool.

Pregnut recommends the following:

℞ Cocainæ,
Chloralis,
Hydrastis,
Mentholis, āā 0.33;
Petrolati, 8.00.

M. fiat ungt. S.: Apply locally in nasal space.

The unguentum hydrargyrum oxidum flavum with equal parts of Adeps lanæ makes a very good ointment.

In Eustachian deafness from coryza Allyn, of Edinburgh, prescribes:

℞ Mentholis, 0.18;
Cocainæ, 0.12;
Petrolati, 15.00.

M. fiat ungt. S.: Paint on nasal mucous membrane as far as possible back into the nose several times a day. This causes a free flow of secretion.

Internal Remedies.—Following is a really meritorious article among the many remedies which are said to cure coryza and catarrh through the blood:

Powdered gentian, 4.00;
Powdered buchu, 2.00;
Powdered uva ursi, 2.00;
Powdered hydrastis, 2.00;
Saccharin, 0.10;
Potassium iodide, 12.50;
Powdered senna, 15.00;
Alcohol, 2.00;
Aromatic elixir, ad 60.00.

Dissolve the saccharin in the alcohol, and add to the elixir in which the iodide of potassium has been previously dissolved. Now add the pow-

dered drugs and macerate for one week. One or two teaspoonfuls an hour before each meal and at bedtime.

The following also gives good satisfaction:

Quinine sulphate, 1.33;
Powdered capsicum, 1.33;
Comp. acetanilide powder, 0.75.

Make 10 capsules. S.: Take one every two hours.

This can also be made into tablets, but is better in capsules on account of being made up fresher and in smaller quantities. Another good formula for tablet or capsule is as follows:

℞ Quininæ hydrobromatis, 1.33;
Pulv. Doveri, 0.65;
Pulv. acetanilidi co., 0.65;
Aloini, 0.33;
Pulv. capsici, 0.33;
Res. podophylli, 0.075.

M. fiat in caps. vel tabellæ No. X. S.: Adults take two tablets every three or four hours till the bowels act well, then four times a day till cured.

A very good internal remedy consists of equal parts of spirits of nitrous ether and aromatic spirit of ammonia, of which a teaspoonful is taken in an ounce of water, and repeated every four hours.

In the beginning an attack may be cut short by moderately large doses of quinine, opium, or the ammonium salts. The following combination is recommended in the early stages of the disease:

℞ Morphinæ sulphatis, gr. ⅛ or 0.008;
Atropinæ sulph., gr. 1/120 or 0.0005;
Pulv. ipecac. comp., gr. x or 0.65;
Quininæ sulphatis, gr. vj or 0.40.

M. fiat in caps. No. I. S.: One at bedtime, followed by a hot drink.

The attack may be cut short by administering spirits of camphor in 10-drop doses on a lump of sugar, or potassium nitrate in 5-grain (.30) doses, spirits ætheris nitrosi in 20-minim (1.30) doses, or a solution of ammonium acetate in 2-drachm (8.00) doses repeated from time to time. Preparations containing ammonium carbonate or ammonium chloride combined with liquor ammonii acetatis are recommended.

Camphor, gr. ¼;
Belladonna ext., gr. ⅛;
Quinine sulphate, gr. ¼.

Or the Edwards formula:

Atropine sulphate, gr. 1/500;
Aconitine, gr. 1/500;
Morphine sulphate, gr. 1/100;
Calomel, gr. 1/10.

Either of these may be taken hourly till a physiological effect is produced, and then less frequently.

Hygienic and Preventive Treatment.—Avoid too much animal food all the time. Meat but once a day. To the gouty the time-honored advice, "No red meat and no vegetables taken from the ground." Proper daily exercise. Proper care of the skin and the eliminative functions: this includes regulation of the bowels and the daily bathing in the morning. Good stout shoes should be worn with cork soles if necessary, and rubbers avoided unless in very stormy weather. Heavy furs and wraps should be avoided. The old saying that "sealskin sacques kill more people than the smallpox" is not far from the truth. Clothing next to the skin should be at least in part woolen. The Turkish bath has always enjoyed a high reputation for aborting coryza. If it be tried the patient must be kept indoors for some time, and if practicable should remain in the bathing establishment all night.

Vascular mechanism of the nose is somewhat unique, and a full understanding of it is called for in order to explain the sequence of various pathological changes. To the blood-supply of the turbinated bones does this observation apply with special force. The larger arterioles are well supplied with muscular coats and lie in the deepest layers of the mucosa close to the bone. These views of the anatomical structure are those of Zuckerkandl, who also reminds us that the arteries enter the nose through the various bony foramina along with the veins. If from any cause the artery dilates it must compress the vein against the bony wall. While therefore the inflow of blood from without is increased the outflow is diminished, and engorgement is the result, from two causes. Arterial contraction produces, of course, the reverse result.

In all prescriptions for recurrent coryza where you prescribe cocaine do not forget to add "Ne repetatur."

DIRECTIONS FOR DETERMINING THE OPSONIC INDEX OF THE BLOOD.

BY E. C. L. MILLER, M.D.,

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The subject of immunity is now being studied as never before. It is recognized to-day as the subject of paramount interest in medicine. Thanks to the genius of certain English workers, we are now able to make a quantitative determination of at least some of the factors which go to make up immunity. Heretofore the only test for immunity consisted in inoculating the animal with the germ in question, and from the amount of culture which it could withstand we tried to form some idea of the degree of immunity. Now we are able to separate the resisting factors of the body (cells and fluids) and measure *in vitro* their power to overcome the bacteria. The method is simple, and, fortunately, applicable to man as well as to the lower animals. This fact at once makes it of interest to the physician, for by this means he is brought one step closer to his patient's actual vital condition. Methods have also been discovered by which the degree of immunity toward any particular microorganism can be increased, and thus is placed in the practitioners' hands the means of treating disease by nature's own methods.

FIG. 1.—Emulsifying bacteria.

FIG. 2.—Grinding bacteria.

Having recently spent some time in Sir A. E. Wright's laboratory in London, it seemed that it might be of interest to readers of the GAZETTE to have in concise

form the methods employed by the pioneer in this line.

Preparing the Emulsion of Bacteria.—The culture of the germ in question growing on inclined agar is removed and emul-

FIG. 3.—Glass needle.

sified, the method of emulsifying depending upon the character of the germs, and upon the age of the culture. In a young culture (12 to 24 hours) of an easily emulsified germ it is usually sufficient to wash off the culture with 0.85 per cent salt solution and draw it up and down repeatedly in a pipette (see Fig. 1). In a culture less easily emulsified it may be necessary to grind the culture lightly. This is best done between two pieces of plain glass (see Fig. 2). In the case of bacillus tuberculosis the emulsion may be made from fresh culture, or from dry, dead tubercle germs. These need considerable grinding between the glass plates. After grinding and diluting the emulsion is centrifugalized to remove

FIG. 4.—Collecting blood for corpuscles.

the clumps of bacteria, and then tested for density by determining its phagocytic index when opsonized with normal serum. The proper consistency is one that will give a count of about two bacteria per leucocyte for tubercle, and a count of from three to five for other germs. The best strength of saline solution for diluting tubercle and gonococcus is 1½ per cent; the strength to use for most other germs is 0.85 per cent.

Preparing the Washed Blood-corpuscles.—Things required: An ordinary gauze bandage or a piece of light rubber tubing; 1½-per-cent sodium citrate solution; a special blood pipette; two blood capsules.

The capsules may be of various sizes and shapes, depending on the amount of corpuscles required, and upon the character of the centrifuge to be used. Fill two capsules three-quarters full of the sodium citrate solution; make a pricking needle by

FIG. 5.—Tube of blood and citrate solution before and after centrifugalizing.

drawing out the long capillary arm of the pipette in a pilot flame; wind one finger centrifugally with the bandage or rubber tube in order to cause marked congestion in the tip of the finger. Prick the finger with the glass needle (see Fig. 3)—preferably at the root of the nail—and allow the blood to flow into one or both of the capsules containing sodium citrate solution (see Fig. 4). Mix the blood and citrate solution, and having balanced the tubes carefully, centrifugalize until the corpuscles are thrown down (see Fig. 5). Remove the supernatant sodium citrate solution carefully, and wash the corpuscles in 0.85-per-cent sodium chloride solution. Again centrifugalize and remove the saline as completely as possible. The last drop of saline can be best removed by inclining the tube and drawing the saline into a cap-

illary pipette from the back portion of the meniscus (see Fig. 6).

Directions for Preparing the Serum.—Bleed the finger, as before, allowing the free flow of blood. It is best made in the small pilot flame, provided with some Bunsen burners to keep the gas alight when the main flame is turned off. Hold the capil-

FIG. 6.—Removing last drops of saline solution.

blood to flow into the special blood pipette (see Fig. 7). Place the blood pipette in the incubator for fifteen to thirty minutes, and if the serum be not clearly separated by the end of this time, centrifugalize it.

FIG. 7.—Collecting blood for serum.

In obtaining blood for this work it is better not to squeeze or knead the finger. If the blood is to be transported some distance, it is well to seal off the end of the straight arm of the pipette in the flame, and after it has cooled to shake the blood down into this arm (see Fig. 9). In sealing it the body of the pipette should be grasped so as to protect the blood from the heat.

The glass pricking needle is thoroughly aseptic, causes very little pain, and gives a lary tube in this flame until it softens, then remove from the flame and rapidly draw the softened part out into a hair. Break off the flexible portion, and the sharp point remaining is the pricking needle.

Putting Up the Test.—Take up in an opsonizing pipette equal quantities of blood-corpuscles, bacterial emulsion, and blood serum in the order named, separating them by means of air bubbles (see Fig. 10). Drive the liquids out on to a slide

FIG. 8.—A convenient form of centrifuge for opsonic work.

and mix thoroughly (see Fig. 11). Take up in the pipette, seal the end in the flame, and incubate for fifteen minutes (see Fig. 12). In drawing the mixture into the

FIG. 9.—Pipette containing blood ready for transportation.

pipette for the final time, care should be taken to avoid air bubbles, as these interfere with phagocytosis.

In order to get accurately measured portions of the different fluids, the usual method is to make a mark with a wax pencil on the capillary portion of the opsonizing pipette, about ⅝ or ¾ of an inch from the end. Then, by means of a rubber nipple on the other end, the blood-corpuscles are drawn into the capillary tube up to the mark. The pipette is then removed from the corpuscles, and the column of the corpuscles lying between the end and the mark is drawn up the tube a short distance, leaving an empty space at the end of the capillary tube. The suspension of bacteria is now drawn in up to the mark and remains separated from the blood-corpuscles by the distance the corpuscles were originally withdrawn from the end. In a similar way a portion of the blood serum is drawn in and then all are driven out and mixed. Beginners sometimes have difficulty in working accurately with an opsonizing pipette, but a little practice usually brings confidence and accuracy. Pushing the glass tube well up into the rubber nipple and grasping the glass tube through the rubber gives one a firmer grasp and a more delicate control over the column of liquid. Drawing the corpuscles in first helps, as they do not move as freely as the thinner liquids. Those who prefer can manipulate the pipette by mechanical means, as shown in Fig. 14. To avoid air bubbles when drawing the mixture into the pipette for the last time, have the end of the capillary tube square-cut and hold the pipette perpendicular to the slide.

Making the Smear.—Remove the opsonizing pipette from the incubator; break off the sealed tip; drive the contents on to a slide, and spread out into a film by means of a special spreader. The spreading is usually done by means of another slide, from which the corners have been broken off, in order that the smear may not cover the entire width of the slide (see Fig. 15). A good smear greatly facilitates the otherwise laborious work of counting, and each worker usually develops his own favorite way of accomplishing this result. Perhaps as good a form of spreader as any is one with the spreading edges sharp and smooth and the spreading end concave (about 1½ diopters). Such a spreader is brought in

FIG. 10.—Opsonizing pipette containing blood-corpuscles, bacterial emulsion, and blood serum.

FIG. 11.—Mixing liquids by repeatedly expelling onto slide and redrawing into pipette.

FIG. 12.—Opsonizing pipette ready to incubate.

contact with the drop to be spread, rocked slightly to distribute the drop uniformly across the end of the spreader, and then, while held at an angle of about 30 degrees above the horizontal, is drawn along the slide until the drop is exhausted (see Fig. 16). The drop should not be so large as to extend to the end of the slide (see Fig. 17). A good smear should be uniform in consistency, and most of the leucocytes should be found along the edges and at

FIG. 13.—A small incubator of special design for opsonic work.

the end. For convenience in counting it is well to have the smear terminate abruptly, and not be drawn out into threads or irregular forms (see Fig. 18).

Staining.—Any good stain that brings out in sharp relief the bacteria and white blood-corpuscles can be used. For tubercle, carbol fuchsin with methylene blue as a counter-stain is usually employed. For staphylococcus and other germs, Leishman's or J. H. Wright's stain may be used. An important point is to stain all the slides for one opsonic test at once—that is, the slide made from the patient's blood and the one from the normal serum should be treated exactly alike in staining. Two rods of brass or of glass, about 2½ inches apart, supported over a sink, make a convenient

FIG. 14.—Screw control for opsonizing and other pipettes devised by Dr. W. H. Hutchings.

FIG. 15.—Spreader.

rack for staining (see Fig. 19). The slides are placed across these rods, and the fixing, staining, washing, etc., done to all at one time. A piece of filter-paper cut to proper size and laid on the slides serves the double purpose of filtering the stain

and of distributing it uniformly over the slides.

Method of Staining Tubercle.—1. Fix the slides in a saturated solution of corrosive sublimate. Wash.

2. Stain with carbol fuchsin about one minute (carbolic acid 5, fuchsin 1, water 100). The slides should be heated, while staining, until steam is given off. Wash.

3. Decolorize in 2½-per-cent sulphuric acid. Wash.

4. Treat for a few seconds with 5-per-cent acetic acid to reduce the prominence of the red blood cells. Wash.

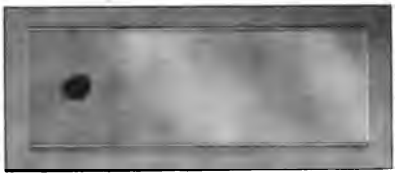

FIG. 17.—The drop ready to spread.

5. Counter-stain with alkaline methylene blue (methylene blue 1, sodium carbonate 1, water 200). Wash lightly and dry.

Method of Using Wright's Stain.—Without any preliminary fixing, cover the film with the stain and allow to stand forty-five seconds. Add about two parts of distilled water, mix, and let it stain two minutes. Wash with distilled water and dry.

Counting.—The essential in counting is to set for one's self definite standards, and always adhere to them. Only typical polymorphonuclear neutrophiles should be counted. It is also well to use the same portion of the smear for counting, both for the patient's blood and for the control, as there is liable to be some difference in the count between those leucocytes found along the edges and those found at the end of the smear. It is also well to have some disinterested party mark the slides in cipher so as to eliminate any psychical error in counting. The average number of bacteria found in the phagocytes gives the phagocytic index. The phagocytic index of the blood to be tested, divided by the

FIG. 16.—Making the smear.

phagocytic index of the normal serum, gives the opsonic index.

Preparation of Bacterial Vaccines.—A culture of the bacteria in question, either from bouillon or preferably from inclined agar, is emulsified with physiological salt solution, either by grinding between glass plates or by shaking in a sealed tube with glass beads. The count is then made of the number of bacteria per cubic centimeter by mixing one part of vaccine, one of normal blood, and three of physiological salt solution thoroughly, and then making a smear of this mixture on a slide. This smear is stained, and then the number of bacteria and of red corpuscles in successive fields of the microscope are counted until at least 200 corpuscles have been counted. As the number of red blood-corpuscles per cubic centimeter is five thousand million, the number of bacteria per cubic centimeter

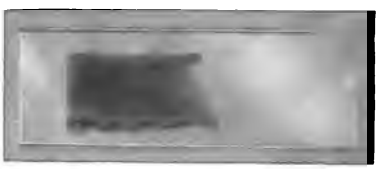

FIG 18.—The smear.

can be determined from the results of the counting by a simple arithmetical process. If the bacterial vaccine is very dense, it is well to take one part of vaccine and a sufficient number of parts of normal blood, so that the number of bacteria does not

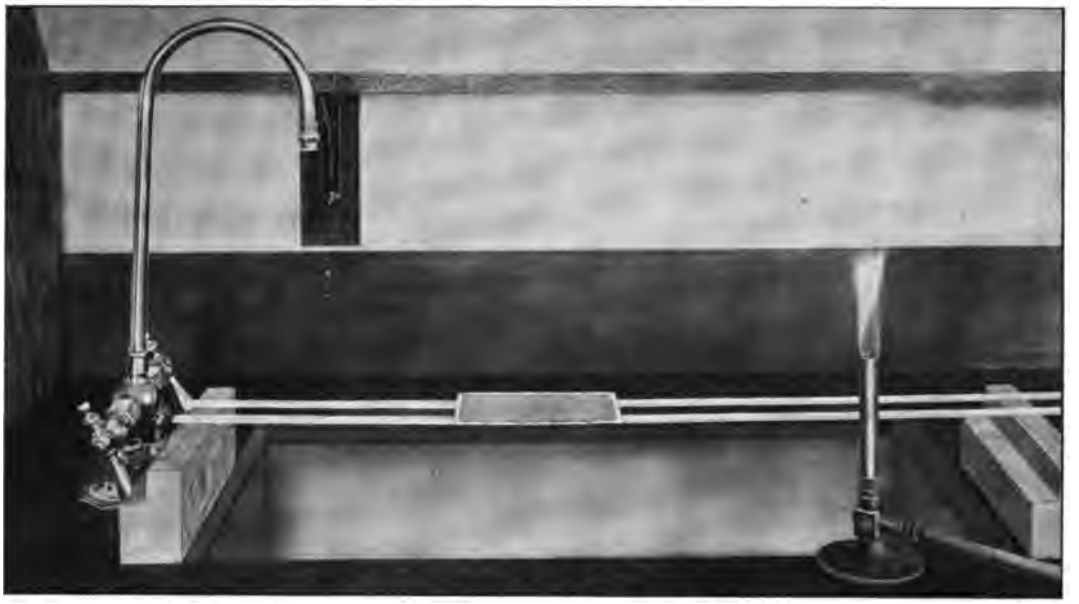

FIG. 19.—Staining rack.

differ greatly from the number of red blood-corpuscles. The vaccine can now be standardized by dilution to any required strength. The vaccine should then be preserved with lysol, or other antiseptic, and

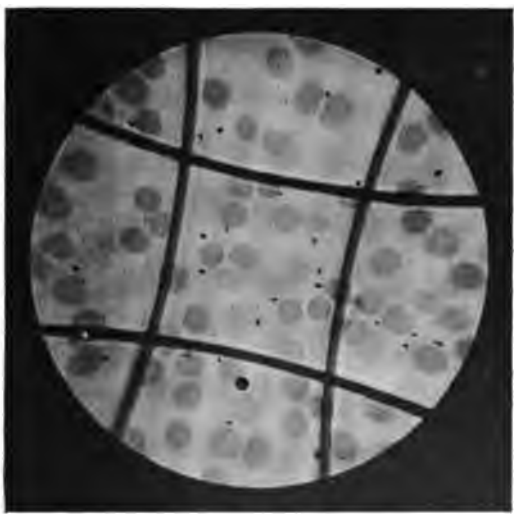

FIG. 20.—Photomicrograph showing cross-hairs, bacteria, and red blood-corpuscles.

killed and sterilized by heat and preserved in sealed glass tubes. In counting it is convenient to have the field of the microscope divided by cross hairs, as shown in Fig. 20. This can be readily accomplished by placing hairs on the eyepiece, as shown in Fig. 21. These hairs can be cemented in place by cedar oil, and then the diaphragm must be pushed up and down in the eyepiece until the hairs are exactly in focus.

In administering bacterial vaccines for therapeutic purposes, the frequency of administration and the size of the doses depend on the kind of vaccine used and on the patient. As a general rule, that dose should be given which gives the maximum of positive phase consistent with the minimum of negative phase. In round numbers, the doses frequently used for the various bacteria are as follows: Staphylococcus 300,000,000, pneumococcus and streptococcus 50,000,000, gonococcus 10,000,000, tubercle (T. R.) 1/3000 mg. to 1/800 mg. It is always best to begin with a small dose and work up, as some patients can stand two or three times as much as others.

Use of the Pool.—The opsonic index of a serum expresses the ratio which its phagocytic index bears to the phagocytic index of "normal serum." Normal serum in this sense would be serum that had never been influenced by the particular bacterium in question. Owing, however, to the limitations of our knowledge, this is quite an impractical standard, and hence resort is had to pooling the blood serum of several presumably normal persons. Each person is bled in the usual way, and after the

serum separates equal portions of the serum are taken and mixed. This mixed serum is the pool. If great accuracy is desired, each constituent serum should be tested against the pool, and those varying markedly from the pool eliminated. A new pool should then be made from the rest.

Cautions.—Samples of the blood designed for the opsonic test should be used as early as possible—they lose their opsonic power markedly after two or three days. The washed blood-corpuscles should be made up fresh. The bacterial emulsions should be made up fresh each time required, but a concentrated emulsion of tubercle may be kept in stock and fresh dilutions made from

FIG. 21.—Diaphragm of eyepiece showing hairs in position.

this as needed. Each bacterial emulsion must be standardized by being opsonized with normal serum. Optical tests for the density of an emulsion are of value in that they enable one to dilute an emulsion to approximately the correct amount, but should not be relied on to take the place of the normal phagocytosis. The centrifuge used in preparing the blood-corpuscles should run without vibration, otherwise the phagocytes are liable to be disintegrated.

USEFUL STUMP AFTER AMPUTATION OF THE ARM.

The idea followed by CECI (*Presse Médicale*, No. 92, 1906) is to leave the tendons of the part in a loop outside of the stump but covered with skin, so that a strap may be passed under the loop and attached in such a way to the artificial arm that contraction of the muscle will make any one movement which may be preferred.

The author reports two successful operations. The first was an amputation just above the elbow. The operation was an ordinary circular amputation, except that instead of cutting through the muscles the insertions of the tendons of the biceps and triceps were separated from the bone and the ends of the tendons sewed together end to end, forming a loop below the bone. Two incisions were then made in the skin cuff laterally and opposite to each other. Each was 2 inches long and 1 1/5 inches from the free border, to which they were parallel. These incisions were brought together in the tendon loop and sewed so as to surround this and cover the stump inside of it. The free border was then sewed over the loop and a strip of gauze inserted in the loop to prevent adhesions. As soon as the scar was solid traction was exercised on the loop, and the patient could lift about four pounds with it. A stump has been fitted, and he can use a hammer well.

The second case was an amputation just above the wrist. This resembled a rectangular flap operation, but the tendons were cut lower than usual and the ventral and dorsal masses each divided into equal parts and sewed end to end in a loop as before, except that two loops were present. Two incisions were made in each skin flap, each one-fifth inch long and parallel to the free edge, one being four-fifths of an inch from that, and the other four-fifths of an inch higher. The two incisions in each flap were sewed together under the loops and the free edges of the flaps sewed together over the bone. In this way two loops covered with skin were made. In each loop was put a rubber drain. The traction on the loops was begun two months later, and an artificial arm was fitted in such a way that contraction of the palmar flap caused flexion of the fingers, and of the dorsal, adduction of the thumb. The opposed motions were made by the elasticity of the hand. The hand was most serviceable.

In applying the first dressings great care must be used to avoid pressure on the loops, as their blood-supply is not good and there is a tendency to sphacelation. The dressing must be changed daily, and for this reason a rubber drain is better than gauze to put under the loops.

EDITORIAL.

THE TREATMENT OF PLEURAL EFFUSION.

As is well known to our readers, increasing experience has taught the profession, particularly during the last few years, that it is unwise to permit pleural effusions to exist over long periods of time, and should nature fail to cause a disappearance of the effusion within a very short period after it is formed, it is generally thought that the physician should remove it by the methods which are universally regarded as correct for this purpose. An invariable rule of practice is, of course, to remove the fluid should it by its pressure cause dyspnea or interference with cardiac action, but there is another large class of patients in which the effusion produces practically no objective or subjective symptoms, except on exertion, in which cases very large accumulations of fluid may exist for long periods of time without being recognized. The greater number of pleural effusions which require treatment by instrumental means depend upon an infection of the pleural membrane and not upon simple transudation, and it is to be remembered that most of these cases depending upon infection have present not only fluid in the pleural cavity but a considerable formation of lymph exudate over the surface of the pleura, which renders absorption slow or impossible. In other words, this associated pathological state teaches us that purgatives and diuretics can do little in dissipating pleural effusion because of the local condition.

After an effusion has been present a week or ten days, in the minds of some at a much earlier date than this, it should be withdrawn. The two methods of withdrawal consist in the supposedly simple method of siphonage and the more commonly resorted to method of aspiration. Both of these procedures have been followed in a large number of cases, but the general opinion seems to be that aspiration is usually the better method. In the employment of aspiration, however, there are a number of facts which are often overlooked which deserve attention. It is the custom of many physicians in using the aspirator to produce a very considerable vacuum in the aspirating jar before the fluid begins to flow, with the result that it runs out of the chest with great rapidity, and because of this the lung expands much faster than is desirable. At the same time syncope or other circulatory symptoms may develop as the result of removing pressure from the great vessels of the thorax.

An article by Capps in the *Journal of the American Medical Association* of January 5 serves to emphasize this fact. He has carried out a series of experiments in which he has made estimations of general blood-pressure in connection with the removal of pleural effusion. Prior to the operation a rise takes place because of the excitement incident to preparation, but as the fluid is withdrawn the blood-pressure falls constantly, amounting, as a rule, to not less than about 20 millimeters of mercury. The amount of fluid withdrawn is, of course, an important factor in causing the degree of the fall in pressure, as is also the rapidity of the withdrawal. Thus slow aspiration causes much less fall than rapid aspiration. He also found that in long-standing cases the fall in pressure caused by aspiration is greater probably because the thoracic contents adjust themselves very slowly as the fluid is withdrawn.

In this connection two other papers dealing with this subject are of considerable interest. One is by Forchheimer, of Cincinnati, in the same issue of the same journal, in which he asserts that in his belief practically no contraindications for thoracentesis exist, and furthermore the danger of removing fluid from the chest, although always insisted upon, can be reduced to a minimum if the operation is done with care. Personally he has never seen a bad result, but he insists upon the need of using a low vacuum in the withdrawal, and he also reminds us that not infrequently the removal of a small

quantity of fluid, perhaps by diminishing intrathoracic pressure, is not infrequently followed by a rapid absorption of the fluid. He also insists upon the patient being as nearly as possible in the recumbent position, and in the aspiration being stopped if violent coughing or faintness comes on. The other paper to which we refer is that of Sears, which appeared in the *American Journal of the Medical Sciences* for December, 1906. Sears speaks of a number of accidents following thoracentesis. It has been thought by some that in those cases in which serious cardiac difficulty has arisen the aspirating needle has entered the lung and damaged a fiber of the vagus. In other instances pneumothorax has followed puncture of the pulmonary tissue, the physician having made an error in diagnosis and mistaken a pulmonary consolidation for a thoracic effusion. Even when this mistake is made, however, pneumothorax does not always ensue, and as a matter of fact Sears has only been able to collect a comparatively small number of cases of serious accident. The same writer advises that where the effusion is a large one, and particularly if it has existed for a long time, the method of Forlanini, namely, the introduction of some sterile air into the thorax in place of the fluid, is advisable, as this form of pneumothorax is not disadvantageous and prevents too rapid expansion of the tissues which have been compressed by the effusion.

THE RELATIVE VALUE OF THE SALTS OF SILVER.

For many years, before the importance of bacteriology as a branch of medicine was recognized, practical physicians knew that solutions of the nitrate of silver possessed valuable curative properties in certain inflammatory conditions, more particularly in the eye and in the urethra, which we now know to be due to various forms of infection. During the last ten years a large number of salts of silver have been introduced by various manufacturers with the object of providing substances which would be equally efficacious and which would not possess the irritating properties of the ancient nitrate. Increasing experience in regard to these substances has pretty definitely determined that none of them equal the nitrate in therapeutic value, although in certain cases they have a distinct therapeutic usefulness. Our attention is called to this matter by an interesting contribution made by Dr. George S. Derby, of Boston, to the *Boston Medical and Surgical Journal* of September 27, 1906 (see also de Schweinitz in THERAPEUTIC GAZETTE for January, 1907), in which he reports his results in determining the bactericidal power of the numerous silver preparations. He tested argyrol, protargol, collargol, largin, ichthargan, albargin, argonin, and argentamin. It is claimed for most of these newer preparations that they do not precipitate in the presence of albumin. He used nitrate of silver to a certain extent as a control. As is well known, the nitrate of silver salt forms dense precipitates in albuminous and saline fluids, but is an efficient germicide in solutions varying in strength from one-half to two per cent. Derby found that, with the exception of argyrol and collargol, the various silver preparations named are efficient bactericides in the laboratory, but that their bactericidal properties are markedly retarded by the introduction of bovine blood serum—in other words, in the presence of albumin they fail.

He considers that all these preparations of silver may be divided into three classes: The first, those non-irritating ones of low bactericidal power, such as argyrol and collargol; secondly, the more effective and slightly irritating bactericides, such as protargol; and thirdly, the very irritating preparations like nitrate of silver, which act in two ways—as bactericides and as cauterants, the value depending, to a large extent, on the reaction which they set up.

It is interesting to note that in one sense Dr. Derby favors the weak argyrol rather than some of the more active preparations which he has tested, not because he relies upon argyrol as a germicide, but because, as he expresses it, it is an almost inert solution in these respects, but is nevertheless sterile and soothing, and mechanically

washes away the pus, certainly doing no harm, and permitting nature to do her best. But he asks the question, Would not normal salt solution be as efficient and less objectionable?

It must be remembered in this connection that the body has natural powers of protection of its own which should be relied upon largely in a great many conditions, and it is not only conceivable but it is also a fact that very powerful bactericides may seriously interfere with these natural processes. As a matter of fact it would seem that in many instances it is best to employ normal salt solution for ordinary purposes, and to resort to the old-fashioned nitrate of silver solutions when any severe infection is to be overcome.

ETHYL CHLORIDE AS A GENERAL ANESTHETIC.

From time to time we have published in the Progress and Editorial columns of the THERAPEUTIC GAZETTE information in regard to the usefulness of this comparatively new anesthetic. It seems to be pretty well decided that it is by no means as safe as it was at one time thought to be, and that it occupies a position between chloroform and ether as to its danger, although it approximates the danger of chloroform much more closely than it approximates ether, various statistics giving the death-rate at from 1 to 2500 to 1 to 8000 of cases anesthetized. In all probability the lower percentages are incorrect, for it is rare for an anesthetist to report in the medical journals every untoward effect or even every death which he may have under the influence of a drug, and we know of one instance at least in which sudden and unaccountable death occurred from ethyl chloride of which there is no record in medical literature. On the other hand, it must be remembered that anesthetics are often given to patients who are suffering from such grave diseases that a very slight variation from the ordinary course of their lives may result in sudden death, the discredit of which is given to the anesthetic, when, as a matter of fact, going up a flight of stairs or eating a hearty meal might have produced death with equal rapidity.

In the *British Medical Journal* of November 10, 1906, Daniell writes in an entertaining way of the use of ethyl chloride as a general anesthetic in conjunction with ether. He believes that a certain number of accidents are due to a want of experience on the part of the administrator, and he calls attention to the fact that just as much skill is required in the administration of ethyl chloride as in the administration of chloroform. He advocates the use of ethyl chloride for a short time to be followed by the use of ether. His views are of great value. Daniell is modest in stating that although he has given ethyl chloride about two thousand times he does not consider that he has had a sufficient number of cases to justify him in giving statistical results. The idea is to administer the ether as soon as the primary anesthetic effects of the ethyl chloride are present. He rarely employs more than 2½ cubic centimeters of ethyl chloride.

WHAT IS THE INFLUENCE OF ALCOHOL ON HEPATIC GLYCOGEN?

Although the question which heads this editorial note does not possess any direct interest to the general practitioner, it is worthy of notice because all investigations which aid us in determining the value of alcohol in medicine should receive careful attention on the part of medical men. Very recently in the *Journal of the American Medical Association* Salant has reported a number of experiments made with the object of determining the correct answer to the following propositions:

(*a*) Does alcohol, on account of its high calorific value, spare the glycogen of the liver and thus retard its disappearance? Or

(*b*) If it fails to do so, does alcohol behave like other various toxic substances in this regard, and accelerate the disappearance of glycogen from the liver?

His reply to the first question is an expressed belief that alcohol does not spare hepatic glycogen, and his conclusion in regard to the second question is that large

quantities of alcohol hasten the process by which glycogen is made to disappear from the liver, although this action is apparent only after the stage of intoxication has been passed.

The first point that strikes us in a consideration of these studies is a matter which we have noted on previous occasions, namely, that the quantities of alcohol which were used in these experiments are so far in excess of the quantities which were ever given for medicinal purposes that the results obtained are of very little value. Thus, we find that the doses of alcohol were sometimes as high as 12 to 15 cubic centimeters of 60-per-cent alcohol per kilo; in other words, about 3 or 4 drachms to a little more than each two pounds of the animal's weight, which would be equivalent to 300 drachms or 37 ounces, or more than 2 pints of whisky, for a man weighing 150 pounds. That the quantities of alcohol in the experiments were also far in excess of those which can be compared to ordinary doses is proved by the fact that several experiments are cited in which the animal, when killed, was in a state of deep intoxication, and in one instance the animal actually died from the quantity of alcohol which was administered. We do not think therefore that these experiments can be utilized to judge of the influence of alcohol in medicinal doses, nor can they in any way govern our employment of this drug for the purpose of combating infectious diseases.

MODERN SURGERY OF THE KIDNEY.

Although many practical surgeons still remain skeptical as to the aid which can be rendered by laboratory research, and skill in the use of modern instruments, Kümmell (*Surgery, Gynecology, and Obstetrics,* January, 1907) is not to be numbered among these. Indeed, he may be ranked as perhaps overenthusiastic; but scarcely this if his statement be accepted to the effect that whereas in former years he experienced one fatal outcome in six cases of extirpation of the kidney on account of absence or insufficiency of the other organ, there has not been a single death from such a cause among 148 nephrectomies where an accurate application was made of the newer diagnostic helps.

The successful practice of modern surgery of the kidneys, he believes, depends upon the *x*-ray, the cystoscope, the ureteral catheter, and upon methods of functional examination, notably cryoscopy.

In regard to the *x*-ray it is held that every stone in the kidney becomes visible on a good plate if the proper technical precautions are observed; if the plate fails to show a shadow stone is not present. Among 84 operations for renal calculi 65 gave perfect *x*-ray pictures of stone corresponding exactly to the specimens removed. In an equally large number of cases in which, clinically, there was a possibility of calculus though the *x*-ray gave negative results, operation disclosed other conditions.

Without regard to the state of nutrition of the patient or the chemical composition of the stone, a carefully selected position, a good soft tube, and a well-adapted diaphragm will, if several skiagrams be made, indicate with absolute certainty the presence or absence of the calculus. For the correct interpretation of the *x*-rays proper illumination is essential. The picture should be examined in a dark room, placing it in a cabinet which should be lighted with greater or less intensity, and sometimes opera-glasses are necessary that the pictures may be seen at a greater or less distance and that the delicate shadows may be interpreted with greater certainty.

In so far as ureteral catheterization is concerned, Kümmell feels that no one who has mastered this technique will oppose it, nor has any such seen bad results from its application. In children ureteral catheterization is often difficult because of the narrowness of the ureteral lumen.

Simple cystoscopy is serviceable in the absence of ureteral catheterization, since it shows the presence of the ureteral openings, allows an inspection of the character of the fluid escaping from each, and will usually lead to an inference as to which of the two kidneys is diseased, this being particularly

true in regard to tuberculous nephritis. The segregator should be used only when it is impossible to catheterize the ureter.

The determination of renal function, a matter of vital importance to the surgeon proposing operation upon one or both kidneys, is held by Kümmell to be best determined by cryoscopy. He has in the last five years undertaken a methodical determination of the freezing-point of the blood and of the urine, his researches including more than a thousand cases. The method is based on the idea that the function of the kidney is osmotic and that its work may be calculated from the product of the gland—*i.e.*, the urine, and its source, the blood serum; and that these two fluids, the solvent of which is water, are subject to the laws of osmosis. By osmosis is understood the changing relations between two chemical solutions of different concentrations which have for their purpose the equalization of these differences of concentration.

It has been demonstrated that there is an increased concentration of the blood if there is kidney disease, and that with the increase of the osmotic concentration of the blood there is a corresponding decrease in the osmotic pressure of the urine. While the kidney function is normal all nitrogen-containing molecules will be excreted by the kidney, while if there be a disturbed kidney function a retention of nitrogenous compounds in the blood will occur.

The osmotic concentration is determined by the lowering of the freezing-point. "The determination of the freezing-point is carried out with the Beckmann apparatus. This consists of a fine thermometer with 100 divisions, each of which is again divided into 100 parts. The thermometer is immersed in a glass cylinder in which the fluid to be examined is kept in constant motion by a platinum rod. The glass cylinder, with the thermometer and fluid, is placed in a freezing-mixture at a temperature of minus four degrees Celsius. Whilst being constantly stirred there is a moment when the fluid congeals. By the change from a liquid to a solid state heat is liberated, which permits the column of mercury to snap up to a certain point, where it remains stationary for a time; this is the physical freezing-point. In a similar manner the freezing-point of distilled water is determined. By subtracting the figure obtained by the freezing of the solution from that obtained by the freezing of water, there is obtained the figure which shows how much lower the solution freezes than distilled water. In the case of blood there is a difference of 0.56° C. The sign chosen for this is a small Greek *d* (δ); the capital Greek *d* (Δ) designates the freezing-point of urine." Twenty to fifty cubic centimeters of blood is obtained by means of a hollow needle thrust into a partially congested arm vein. This is caught in a glass cylinder which is to be used for the examination, is defibrinated by stirring with a platinum rod, and is then examined for its freezing-point. In the second cylinder the freezing-point of water is determined each time to test the thermometer. Kümmell states that with sufficient practice the examination can be made in from fifteen to twenty minutes.

As to the practical deductions obtained from 1200 cases examined in regard to the freezing-point, it is noted that with undisturbed renal function the molecular concentration of the blood is ever constant, this not materially changing in acute diseases, providing the kidneys remain intact. In all cases in which there is extensive bilateral kidney disease the freezing-point of the blood is lowered below 0.58°; the majority of the figures vary between 0.60° and 0.65°. In a number of cases the beginning of a uremic attack was strikingly indicated by a lowering of δ Coincident with this increased concentration of the blood it was usually possible to demonstrate a decrease in molecular concentration of the urine (Δ), the figures varying between 0.9° to 0.3° and 0.2°. Neither in pneumonia nor in uncompensated heart disease has Kümmell been able to show increase in blood concentration, though Koranyi in his first publication noted that in these conditions there was often a marked lowering of the freezing-point. In fever with nor-

mal kidneys the freezing-point of the blood may be elevated by 0.002° to 0.003°, which does not indicate disturbed kidney function. In eclampsia there is a freezing-point of 0.60°. Large kidney tumors gave a freezing-point of 0.60°. Kümmell criticizes the methods of cryoscopic examination employed by Rovsing and Koch, and points out that these methods are not calculated to give uniform or intelligible or practicable results. He holds that according to his experience a freezing-point of 0.6° marks the limit beyond which it is extremely hazardous and inadvisable to remove a kidney, and cites several cases apparently proving this proposition. The nephrectomies shown to have a normal freezing-point before operation invariably demonstrated postoperatively that the kidney which was left was functionally adequate.

As to cryoscopy of the urine, this when applied to that taken from the bladder, *i.e.*, from both kidneys, is without value. When, however, the urine of each kidney is obtained by ureteral catheterization determination of its freezing-point, together with examination of urea, may throw greater light upon the subject. Reflex anuria is by Kümmell not accepted, he holding that when this occurs it is always a sign of bilateral disease.

In differential diagnosis he regards cryoscopic examination as of great importance, particularly in determining between stone in the kidney and hemorrhagic nephritis with unilateral pain. An increase in the molecular concentration of the blood to 0.65° and a simultaneous and permanent decrease in concentration of the urine will necessarily prove that there is bilateral disease.

Kümmell notes that in numbers of cases of back pressure from enlarged prostate the concentration of the blood is high, having been noted to 0.71°, and in accordance with the general principles of his paper advises against operation when the freezing-point is below 0.6°, a piece of advice which but few surgeons would be inclined to follow.

Kümmell's method of examination after having obtained a history of the case and after palpation is to have the urine gone over thoroughly, this being followed by cystoscopy and by catheterization of the ureters. The urine from each kidney is examined as to its urea content and its freezing-point is determined; moreover, its concentration is often measured by its electrical conductivity, and the results obtained from the two organs are compared. The urine is examined bacteriologically, microscopically, and chemically in the usual way, and this is followed by cryoscopy of the blood, and by the *x*-ray picture if calculus is suspected. Indigo-carmine injections are sometimes used as a method of locating the ureteral openings where these are difficult to find.

Where these examinations disclose the probable existence of one diseased and one healthy kidney cryoscopy of the blood, if it shows normal freezing-point, will indicate with great certainty the adequacy of the remaining healthy kidney. Even when there is evidence of involvement of both sides, but one to a much less degree than the other, if the freezing-point of the blood be normal, Kümmell holds that the evidence is present to prove that the partly diseased organ is still capable of eliminating with sufficient activity to preserve life. When ureteral catheterization is impossible cryoscopy is particularly valuable as indicating the advisability of radical operation after opening down on the suspected side, since the normal freezing-point of the blood indicates removal of the kidney if this be found extensively involved, while a freezing-point below 0.6° contraindicates removal even though there be found extensive disease. Kümmell closes his valuable, almost convincing, eulogism of cryoscopy as follows:

"Among the methods of determining the kidney function, cryoscopy has proved itself of the greatest value, and with the proper care in technique has never failed us in over one thousand examinations. Cryoscopy is not intended to displace any other method, especially not ureteral catheterization, but even in those cases in which the other methods are inadequate it

is of complementary value, and has so proved itself. On account of its relative simplicity and its accuracy in determining the renal function, I hope that this valuable method may receive a wider recognition and a more universal application."

PRACTICAL VALUE OF EXAMINATION OF THE FECES.

It is only in recent times that either the practitioner or the surgeon, at least in this country, has considered an examination of the feces of sufficient importance to make it a routine measure. In cases of subacute pancreatic disease examination for excess of fat, which in itself is not necessarily characteristic, has been practiced for many years. Visible blood, if constantly recurring, has always been regarded as a valuable symptom from the surgeon's standpoint, and the same may be said of the absence of bile pigments in the fecal discharge.

Roberts (*New York State Medical Journal,* January, 1907) contributes an extremely valuable article embodying not only the technique of fecal examinations but the practical deductions to be drawn therefrom. He appreciates the difficulty incident to such examinations, since findings which may be pathological for one diet may be normal for another. He has formulated what he calls a standard intestinal diet, giving this in detail and in such measurements as are readily applicable in the ordinary household. The quantity and variety of each of the three daily meals are laid down. Immediately before the first meal a capsule containing 5 grains of carmine or a tablet of charcoal is given. At the end of the second day another dose of coloring is administered. Thus the entire feces resulting from the diet are demarcated. Judging from the appearance of the first color the time of passage is estimated.

An examination is started with careful macroscopic inspection. Roberts holds that the annoyance of weighing the dejecta is not compensated by any knowledge gained therefrom, and notes that the bodies of bacteria make up about one-third, and the débris of secretions and intestinal mucosa about one-fourth, of the solids of the feces under normal conditions, the remaining portion, about one-third of the solids, being the residue of foodstuffs ingested. Therefore it follows that daily stools measuring well up to the normal bulk may be expected, even though the individual be on greatly reduced diet.

The consistence of stools is of importance only if the diet be considered. This is normally semiliquid after the ingestion of an overabundance of fat or fresh vegetables, or the taking of an excessive quantity of fluid. Unformed stools in the absence of such diets, if individual idiosyncrasy be excepted, are pathological.

Fluid stools are due either to failure of water absorption from deficient absorptive powers of the mucosa, or too rapid colonic peristalsis, or to the addition of fluid from the intestinal walls in the form of serum, pus, blood, or mucus. Very watery stools are due either to failure of water extraction or the addition of serum. In the transitory diarrheas due to intestinal irritation or nervous excitation there exists hyperperistalsis characterized by frequent defecation with small fluid evacuations, which may be very foul. When the fluidity is due to the addition of serum, as in acute serous colitis, each passage is copious, is whitish and frothy, and with a little odor.

Abnormal hardness of the feces should be attributed to deficient fluid ingestion or prolonged retention.

The form of solid stools is often suggestive, since decrease in caliber if persistent points to spasmodic or organic contracture at some point from the cecum to the anus. High contractures cause cylinders of small caliber passed with softened feces. Ribbon-shape stools are commonly due to contracting conditions about the anus. Small balls of fecal matter may pass in either spastic or atonic conditions, whilst the large balls indicate an atonic condition of the colon and usually dilatation of the rectum.

The color variations are wide within

normal limits, being greatly dependent on the diet. Carbohydrates tend to lighten the color, whilst a meat diet produces a dark color, greatly exaggerated if the time of passage be prolonged, if the putrefactive process be abnormal, or the mass be exposed to the outside air after passage. Cylinders dark on the outside and light inside probably remained for a long time in the sigmoid or rectum.

Fresh blood is obtained usually only when this comes from the rectum or sigmoid, though if there be free bleeding from high up associated with exaggerated peristalsis, the characteristic blood color may be found in the stools. A fat diet may physiologically cause clay-colored stools without biliary failure. Moreover, it sometimes occurs that the bile is reduced to a colorless bile salt in the intestine; then the chemical examination is needful to positively determine whether absence of the normal color be really due to absence of bile.

The green stools of infants may exceptionally be due to the growth of a chromogenic bacterium, but a greenish hue results from increase in the peristaltic rate, since during the first year of life the changing of bilirubin and biliverdin to urobilin is not complete when the mass reaches the cecum, as is the case in later years. Even in normal peristalsis a green tint after exposure of the infant's feces to air is natural.

If on macroscopic inspection mucus is found in the stool, this constitutes evidence of inflammation of the intestinal tract, there being only two exceptions to this rule: the first is in the form of a thin, glistening coat of mucus on a hardened cylinder of fecal matter due to a somewhat long retention within the rectum. The true cause of this mucus is evident if a softer mass fails to show such mucous coating. The second exception is found in the seemingly mucous masses of membranous colitis, which in fact is not a true inflammation.

An evacuation of pure mucus indicates a catarrh of the descending colon, sigmoid, or rectum, accompanied by defecation so frequent as to prevent fecal admixture from the bowel above. With subsidence of inflammation fecal matter is added to the mucus, but not intimately mixed with it. When there are frequent passages of thin feces, with small masses of mucus, in lumps or shreds, intimately mixed with the feces, there is acute inflammation of the upper and lower portions of the colon. The higher the site of inflammation the finer will be the subdivision of the mucus, and the more intimately will it be admixed with feces. Its detection then necessitates the use of what Roberts calls the "glass plate" test. Small fecal portions are rubbed up with water, and spread out between glass plates of liberal size. If these be held to the light very small particles of mucus are discoverable. He notes that mucus from the upper part of the colon and the small intestine is not ordinarily distinguishable with the naked eye.

In acute catarrhal inflammation of the lowermost portions of the colon a few flakes of blood may be seen, but when there are evident streaks of blood intimately intermixed with the mucus an ulcerative condition is indicated. The presence of purulent fluid mixed with the mucus has a like significance, but indicates a deeper destruction of tissue.

The passage of large shreds of tough exudate resembling diphtheric membrane rather than true mucus is attributed not to inflammation but to a secretory neurosis of the intestines. Roberts notes that these shreds and casts may be found in the feces without a history of true intestinal colic being given.

After completion of the macroscopic inspection a small portion of the stool is removed from the mass for microscopical and chemical examination; the remainder is washed in the stool sieve until only the insoluble and odorless residue remains. This residue from a twenty-four hours' collection on the "test diet" amounts to less than a teaspoonful under normal conditions. Under the microscope the search for mucus is continued. Its appearance in the form of tiny lumps or shreds indicates a catarrh of the small intestine or first portion of the colon; if greenish in appearance the former

origin is certain. Connective tissue fibers are normally present in small numbers. An excess indicates a deficiency of gastric digestion. Muscle fibers with striations faint or entirely lost may be found in small numbers normally. If, however, the pancreatic secretion is lacking in activity the microscopic fields will be covered with large and small fibers in different states of destruction. Both connective tissue and muscle fibers are in excess.

The fat is estimated by heating a few drops of feces with acetic acid and estimating the number of fatty acid crystals. Moderate increase above the normal may have no significance, but the specimen that is of importance is seen to be greasy when spread out between slide and cover-glass, showing abundant droplets of fat, and the crystals cover the entire preparation. True fatty stools may result from overabundance of fat in the dietary, exclusion of bile from the intestine, deficiency of pancreatic enzymes, or atrophic changes in the intestinal mucosa, leading to failure of fat absorption. Excess of fat and exclusion of bile are readily determined, and atrophic conditions of the bowel are rare except in general amyloid disease; fatty stools then, in the absence of these other etiological factors, point to organic or functional disturbance of the pancreas. Under such circumstances meat fibers are also passed in great excess. The combination is not infrequent in certain cases of diabetes mellitus.

The use of a few drops of the feces for the sublimate test is sometimes of value when studied microscopically. The sublimate test is made by adding to 5 grammes of feces contained in a test-tube an equal amount of saturated solution of mercuric chloride. This mixture is allowed to stand for twenty-four hours. After the bile is excluded from the intestine the normal pinkish-red color is absent. Particles stained by the bilirubin become green, and such a reaction shows that the particles have come from the small intestine without a normal reduction to urobilin. Particles stained with biliverdin are shown in the fresh specimen, and have a like significance.

The test for occult blood is of great value, since a constant negative reaction may prove a deciding factor in distinguishing between gall-bladder disease and ulceration of the stomach and duodenum. In any severe vomiting there may be a small amount of blood. A negative reaction of the feces makes it improbable that an ulceration is responsible for the occurrence of the trace of blood in the vomitus. A positive reaction for occult blood in the stomach contents must always be viewed with suspicion if there is much retching attending its expulsion, or if the amount of stomach contents obtained is so small that a trifling amount of intermixed blood could be shown by the test. The turpentine-guaiac test for blood is the one which is most readily applicable and certainly sufficiently delicate for practical purposes. Since the reaction is due to the hemoglobin derivatives it will prove successful when microscopic examination for blood-corpuscles is negative. The fecal mixture is stirred with a third of its volume of glacial acetic acid and the mixture shaken with ether. One or two teaspoonfuls of this is poured into a test-tube, to which are added 10 drops of a freshly made tincture of guaiac and 20 drops of oil of turpentine. Violet or blue coloration denotes the presence of blood. For the surgeon's purpose this test is perhaps most important of all those given by Roberts, since it is well recognized that chronic ulcers of the large bowel, particularly carcinoma, are prone to remain almost completely latent until obstructive symptoms of such severity as to call for surgical intervention develop. When such symptoms have appeared the time for curative operation is likely to be long past.

The constantly recurring presence of blood in the stools in the absence of meat diet, anal lesions, or hemorrhages from the nose, mouth, or pharynx, should lead to a careful search for the presence of an ulcerating lesion, which if located may enable an operation to be performed under conditions which will not only give the best assurance of immediate recovery but also of permanent cure.

REPORTS ON THERAPEUTIC PROGRESS.

A CONTRIBUTION TO THE HISTOPATHOLOGY AND THE THEORY OF DRUG ERUPTIONS.

As a result of a study along the lines indicated in the above title, ENGMAN and MOOK in the *Interstate Medical Journal* for November, 1906, state their views as follows in regard to iodine and bromine eruptions:

1. The local eruptive phenomena are prone to occur at points of previous inflammation; about comedones, acne lesions, seborrheic lesions, scars, traumata, scratches, etc.

2. Traumata, pressure, quick changes of temperature may precipitate an eruption in tissues charged with the drug.

3. Idiosyncrasy or susceptibility may be admitted, as it is in other toxic conditions.

4. The glands or follicles of the skin take no active or specific part in the production of the lesions, and when they are involved it is secondary and passive to inflammatory changes about the vessels and in the connective tissue.

5. The gross histological changes in the skin consist in different degrees of inflammation, from slight changes about the vessels to destructive abscess formation and progressive death of tissue.

6. The minute histological changes or steps to this end may be classed in the following stages: First, increase of connective tissue cells about the vessels. Second, appearance of lymphoid-like cells about the vessels. Third, addition to these cells of trifold leucocytes with granular appearance of collagen, and vacuolation of fixed connective tissue cells. Fourth, local increase of all these phenomena and the formation of an abscess.

7. The first and second conditions are found in the normal skin with iodide eruption.

8. The stages three and four, or the addition of leucocytes and degenerative changes, is induced by local disturbance of the normal equilibrium between the iodine combined in the serum and the tissues.

9. This disturbance of equilibrium may be induced by various factors, and when it does occur the resultant product acts as a toxin, which in its turn causes tissue irritation and the production of various local inflammatory symptoms, the type of symptoms and the eruptions being dependent upon the character of the individual's reaction to the inflammation thus produced, as in any other toxic condition.

10. This theory may be termed the "rational theory," as it explains all the symptoms of iododerma and bromoderma in a purely rational, chemical, and mechanical manner, and does not depend in its elucidation upon the mysterious or purely theoretical action of the vasomotor system.

THE TREATMENT OF GASTROPTOSIS.

FENWICK tells us in the *Edinburgh Medical Journal* for November, 1906, that much can be accomplished in the prevention of gastroptosis by careful attention to the clothing and the early correction of those conditions which are commonly responsible for its development. Young girls should never be permitted to wear tight corsets, and at all ages tight lacing should be prohibited. For a similar reason, strings and bands worn round the waist should be avoided, and buttons substituted for them whenever possible. During the lying-in period, special attention should be bestowed upon bandaging the abdomen, so as to afford a firm support to the viscera and aid the belly to regain its former shape. Any attempt to regain the figure by tight lacing should be discouraged, since the chief effect of the corset is to force the stomach and intestines downward, while it fails to afford any support to the parietes below the waist. Care should also be taken to reduce the gaseous distention of the bowels that usually occurs after delivery, and to overcome the natural tendency to constipation. The patient should never be allowed to walk before the tone of the abdominal muscles has been

restored. The same rules apply to persons who have undergone abdominal operations, and to those cases in particular in which the intra-abdominal tension has been suddenly lowered by the removal of a large tumor or an excess of fluid. The treatment of the dislocated stomach itself is a purely mechanical one. In mild or recent cases, confinement to bed for a month is invaluable, as it not only tends to cut short the progress of the complaint, but completely relieves the symptoms which emanate from it.

• Rest cures also act advantageously, since the patient is forced to occupy the recumbent position; while an excess of nourishment leads to the accumulation of fat in the abdomen. Under all conditions, persons suffering from gastroptosis should be advised to lie down for an hour after meals, and at the same time to loosen the corsets and clothing round the waist. By this simple procedure the symptoms that ensue during the period of digestion are rendered much less severe, and stagnation of the food is to a great extent prevented.

Lavage is of no value unless the condition is complicated by gastrectasis and chronic gastritis, nor in ordinary cases do massage and electricity produce any direct effect upon the stomach. As a means, however, of strengthening the muscles of the abdomen they are often extremely useful.

The essential factor in the treatment is the application of a firm belt to the abdomen, which will support the stomach and hold it in position. Numerous varieties have been devised for this purpose (Glénard, Landau, Bardenheuer, Rosenheim, Teufel), but it must be remembered that a belt that suits one person will not suit another, and consequently that no stock pattern can be prescribed without careful trial. Many of the corset-belts now in fashion either exaggerate all the ill effects of the corset, or afford no support whatever to the prolapsed stomach. As a rule, the binder or belt should extend from the lower border of the twelfth rib to the symphysis, and should be made of some light but firm material, which will not easily stretch. Silk elastic makes an excellent belt, but it needs constant renewal. The support should be applied when lying upon the back, and should be laced or tightened from below upward. To prevent it from riding up, a perineal band may be worn, or, in the case of a woman, the suspenders may be attached to it on either side. For some time the belt must be worn both day and night, but when considerable improvement has taken place it may be left off when the patient goes to bed.

Duret, in 1894, was the first to treat gastroptosis by an operation, which consists of suturing the lesser curvature to the abdominal wall; while three years later Davis adopted the plan of fixing the lesser omentum to the parietes. Rovsing attempted to suture the anterior wall of the stomach, and Coffey the great omentum below the transverse colon, to the parietes; while Beyea and Bier introduced methods of plicating and shortening the gastrophrenic and gastrohepatic ligaments. More recently Eve has reported a case in which a successful result was attained by suturing the lesser curvature of the stomach to the liver. Although the various cases which have been subjected to operation are reported to have improved, the author believes that most cases of gastroptosis severe enough to warrant operation are of too complicated a nature to promise a cure from mere elevation of the stomach, and that the neurasthenia which invariably exists is a more important factor in the production of the symptoms than the mere dislocation of the stomach. When the gastric displacement is due to organic stenosis of the pylorus or duodenum, gastroenterostomy is usually sufficient without suturing the stomach to the liver or abdominal wall. Fixation of the right kidney has no effect whatever upon the coexisting dislocation of the stomach, and usually increases the gastric symptoms by the induction of nervous shock.

The food must be regulated according to the necessities of each case, and the existence or otherwise of complications.

Gastroptosis associated with healthy intestinal functions and good gastric compensation merely requires a full diet composed of substances that are easily digested. Moderately cooked and tender meats, fish,

game, eggs, sweetbread, tripe, sheep's head, calf's head and feet, well-boiled cereals, farinaceous puddings, and a moderate amount of fruit may be allowed; and the patient should be encouraged to drink milk with the meals, and to indulge in cream and other forms of fat. Raw vegetables, pastry, sauces, pickles, and cheese should be avoided. When emaciation is a marked feature of the case, and is attended by neurasthenia, a milk diet is often of great value, five pints mixed with a small portion of lime-water being administered in divided doses during the course of the day.

Gastroptosis accompanied by myasthenia requires a diet suited to this important complication. The great principles to be borne in mind are to supply the stomach with those forms of food which are most easy of digestion, to avoid overdistention of the organ, and to allow a sufficient interval to elapse between the meals, in order that the viscus may completely empty itself on each occasion.

Sugars and fats in excess are always injurious, owing to the tendency of the former to undergo fermentation and of the latter to stagnate in the stomach. Butter and cream may be allowed in moderation, as well as rice and well-cooked oatmeal porridge. Lean meats, white fish, fowl, game, and eggs may be given, but soups and broths should be avoided. Spinach and asparagus may be taken in small quantities, but raw and coarse vegetables are difficult of digestion. An exclusive milk diet rarely agrees, owing to the distention of the stomach which ensues from the introduction of large quantities of fluid, and at most eight ounces should be taken with each meal. Tea and coffee rarely agree, and cocoa proves injurious from the sugar it contains. A decoction of cocoa-husks or cocoa-ribs forms a palatable drink, and is free from the disadvantages which pertain to the other varieties. If the patient is accustomed to take alcohol, a little good brandy or whisky may be allowed; but, as a rule, half a tumblerful of hot water, sipped at the end of the meal, is more beneficial.

When colitis complicates the gastric displacement, the diet should consist entirely of finely minced fish and poultry, tripe, sweetbreads, and sheep's brains, dry toast, meat juices, clear soup without vegetables, potatoes, and plain milk puddings. Green vegetables and fruits are particularly harmful, and as a rule red meats should be avoided. Vichy or Contrexeville water may be taken with the meals.

In uncomplicated cases drugs are seldom of much value, and the treatment is chiefly symptomatic. If the appetite is bad, a dose of nitrohydrochloric or phosphoric acid, combined with a bitter infusion, may be given between the meals. Occasionally the sense of extreme weakness may require the exhibition of strychnine, nux vomica, cinchona, or some other tonic; while in many instances cod-liver oil, the compound syrup of the hypophosphites, elixir of phosphorus, or formate of sodium, produce a beneficial influence upon the symptoms of neurasthenia. Pain after food and flatulence usually depend upon some morbid condition of the gastric secretion, or an increased sensibility of the gastric mucous membrane, and in such cases the compound bismuth mixture, with or without morphine, will usually afford relief. Sometimes a preparation of pepsin or pancreatin appears to aid the processes of digestion. The development of myasthenia requires the addition of carbolic acid to the bismuth mixture, while, in cases complicated by colitis, full doses of salicylate of bismuth or guaiacol should be employed.

The selection of a suitable aperient is always a matter of importance. As a rule, severe purgatives must be avoided, and reliance be placed on small doses of cascara and euonymin, combined, if necessary, with belladonna and rhubarb. In other cases a confection of cascara and malt, taken at bedtime, proves efficient; or one composed of guaiacum, senna, and ginger may be employed with advantage. When colitis is accompanied by constipation, nothing is so effectual as a small dose of castor oil each morning before breakfast; but if severe neurasthenia exists, all purgatives may have to be omitted, and an action daily of the

bowels secured by an enema of soap and water or an injection of glycerin. Carlsbad salts and other salines are chiefly indicated when myasthenia with stagnation of food exists, as their employment effects a form of internal lavage, and the fermenting contents of the stomach are swept into the intestine. In other respects the medical treatment of gastroptosis is conducted upon the lines laid down for the management of chronic gastritis and atony of the stomach.

THE TREATMENT OF INFANTILE PARALYSIS.

MOXON writes in the *Practitioner* for November, 1906, on this topic. He says that as soon as the acute stage has passed off, and the pain and constitutional symptoms have subsided, there are four chief aims to be kept in view with regard to treatment, viz.:

1. To ascertain, so far as possible, the exact extent of the damage done.

2. To anticipate, and prevent, so far as possible, the advent of any definite deformities.

3. To maintain the nutrition and tone of the muscles of the limb, and especially the unaffected ones.

4. To train, or it may be to reëducate, the child in the use of the injured limb under its new conditions, in such a way as to gain the maximum amount of benefit from the action of unaffected or only partially paralyzed muscles, and also to train them, so far as is physiologically possible, to take the place of those muscles which are functionless.

Of these four aims, the last must be considered the most important, not only intrinsically, but also from the fact that, in its accomplishment, the third aim is also most effectively secured; since there is no external stimulus which can be applied to a muscle in order to maintain its tone and nutrition at all comparable with the stimulus which reaches it from the central nervous system by means of its own nerve.

The satisfactory determination of the exact amount of permanent damage which will result in any given attack of anterior poliomyelitis is by no means always an easy matter. The period of acute febrile disturbance is followed by an interval, to which succeeds a period of gradual improvement, which lasts for a variable length of time; and it may sometimes be six months before the exact extent of the final paralysis can be fully and precisely ascertained, but in the majority of cases a very fair estimate may be obtained, within a very much shorter period, by a careful investigation of the electrical reactions of the muscles of the affected limb.

Should an early commencing deformity be detected, a suitable light leather, or poroplastic, splint should be worn at night, in order to correct it so far as possible; and during the day, as soon as the child attempts, or is trained, to use the affected limb, careful watch must be kept to prevent it from using it in such a way as to increase the tendency to any particular deformity in course of development.

As soon as the acute symptoms have subsided, and all pain disappeared, massage and passive movements should be instituted, and of the two the latter is the more important, resistance movements being especially valuable. Massage once a day, and passive movement at least three times a day, should be carried out with the utmost regularity. With regard to the use of electricity in these cases, it is sometimes of great value, but the benefits which are said to result from its use have possibly been somewhat overestimated, and there is a risk of overstimulation of the unaffected muscles, which may tend to increase any developing deformity. In cases in which the muscles react to the faradic current, benefit often results from its use, and if overstimulation of the muscle is avoided no harm is likely to result.

In those cases in which the muscles react only to the constant current one great difficulty often arises. The majority of children strongly object to its use, and while they will often stand a faradic current strong enough to send the observer's muscles into tetanus, they will often not tolerate a galvanic current sufficiently strong to produce muscular contraction, in which case no

object is gained by its use. In short, each case must be judged on its merits with regard to the use of electricity. During this period the general health of the child must be attended to, and tonics, of which strychnine is perhaps the best, may with advantage be administered.

As soon as possible the training of the child in the use of the affected limb must be commenced, in the same way as, after the surgical treatment of the deformities which may result later, the patient has to be taught the proper use of his restored foot. It is in this latter means that the greatest hope probably lies of preventing or neutralizing the complicated deformities so often seen as an after-result of infantile paralysis.

SOME OF THE MANY USES AND THE METHOD OF ADMINISTERING NORMAL SALT SOLUTION.

In discussing this subject in the *Maryland Medical Journal* for November, 1906, MATTHEWS does not attempt to enumerate the conditions which loudly call for the normal salt solution, the most important ones being excessive hemorrhages, toxemia arising from various forms of infection, as in septicemia, uremia, the comatose state of diabetes mellitus, in cholera, and in threatened eclampsia. It is also very useful in severe burns to overcome shock and toxemia.

The best place in women to give an infusion is under the mammary gland, lifting the gland well up and inserting the needle beneath the lower outer quadrant, pointing upward, and allowing the solution to flow in slowly through a needle about two millimeters in diameter. The needle should be inserted while the solution is flowing so no air can be introduced.

The loose cellular tissue and the breast quickly begin to distend; even a flatly atrophied organ will reach the size of a puerperal breast. The amount that can be easily put under a breast is about 700 cubic centimeters. It is more satisfactory in the male and in emaciated individuals to lift the pectoral muscles, directing the needle upward and inward so that the fluid will infiltrate the subclavicular and axillary spaces.

The proper temperature of the fluid can be maintained by letting the tube carrying the saline solution lie immersed in a pan of hot water, about 115° Fahrenheit. The saline enemas, which are often preferable, are best given in the way adopted by Murphy and the Mayos—that is, by inserting a small rectal tube and allowing a small stream of hot saline solution to flow into the rectum continuously. A large amount of the solution is thus taken up in the course of a day. The flow can be regulated by the elevation of the vessel above the individual, or, better, by a clamp on the tubing, limiting the flow to a very small stream, not more than a pint an hour. In surgical cases under anesthesia it is well to give a pint by rectum before the patient awakens, for if given while awakening from the anesthetic the patient will nearly always expel it.

The author only recommends transfusion in very exceptional cases. It is a well-known clinical fact that some cases of shock are not much benefited by intravenous infusions of saline solution.

THE GENERAL PRINCIPLES OF TREATMENT IN INFECTIONS OF THE BILIARY TRACT.

A. O. J. KELLY in the *American Journal of the Medical Sciences* for November, 1906, writes upon this important subject. He asserts that the intelligent treatment of any patient presupposes a clear conception of (1) the pathology of the disease in question, of its pathological anatomy, and its natural tendencies; and (2) of the means of treatment at our command, and the objects attainable by their use. Of these none is more important than a knowledge of the natural history of the disease. To attempt by internal medication to dissolve a gall-stone that is insoluble; to cause the passage through the gall-ducts of a gall-stone when the ducts are impassable to a stone of its size; to attempt to cure supposed gastric symptoms by measures directed to the stomach, when the cause of the symptoms is adhesions, when, perchance, they have been diagnosticated, is as futile as it is irrational.

In view of the frequency of gall-stones in

infections of the biliary tract they may well be included in a consideration of the indications for treatment. The main indications may be said to be: (1) To cause solution of the stone or stones; (2) to cause the discharge of the stone or stones; and (3) to treat the complicating infection.

As regards the solubility of the gall-stones Naunyn states that we have to consider cholesterin, bilirubin-calcium, calcium carbonate, and calcium phosphate. Of these, bilirubin-calcium and the inorganic salts of calcium are insoluble in the bile; cholesterin, however, is quite soluble in the bile, and even in conditions of disease the bile scarcely if ever contains so much cholesterin that it cannot take more in solution. We have, therefore, to admit the possibility of cholesterin stones being dissolved. In fact, there is some experimental evidence that goes to prove that not only *in vitro,* but also *in vivo,* cholesterin stones may be dissolved. Naunyn quotes Labes's experiments of thirty years ago, in which he introduced gall-stones into the gall-bladder of dogs, and killing the animals two months later found that partial solution of the stones had occurred. Recently Bain has published the results of some studies that show the same possibility. In these experiments, however, the calculi were introduced into normal gall-bladders (or, as in one or two of Bain's experiments, into gall-bladders in which a cholecystitis has been artificially produced). The conditions are quite different in the human subject affected with gall-stones—in which we have to deal not only with the stone, as such, but also with the subacute or chronic lithogenic catarrh, the direct cause of the gall-stone formation. It is thus exceedingly doubtful whether spontaneous solution of gall-stones ever occurs in the human subject—indeed, whether it is at all possible. Naunyn states that in studying one thousand cases of cholelithiasis he has seen trustworthy evidence of the solution of the stone in perhaps ten cases (one per cent). Though he does not deny that the solvent action of the bile may be a contributing factor in the process, he inclines much more to the belief that the disintegration of the stone is due to the action of bacteria, and for the reasons that he has found this disintegration, not in cases of a single stone, but in cases of numerous stones; that the process involved many stones; that the solution was not circumferential, as it would be in the event of solution in a dissolving menstruum, but was circumscribed at the periphery and extended deep into the calculi; and that the disintegration went hand-in-hand with the deposition in the stones of inorganic calcium (phosphates and carbonates), certainly due to bacterial activity. The reasons for the non-occurrence of solution of the stones are, first, and most important, the fact that on account of the presence of the stones the activity of the walls of the gall-bladder is compromised, it cannot empty itself completely (a certain amount of residual bile is always present), and the desirable irrigation of the gall-bladder with fresh bile (the solvent menstruum) does not occur; and secondly, the fact that on account of the associated catarrh of the biliary tract the bile contains more cholesterin than is normal, and thus takes up an additional increased amount with less avidity.

Naunyn furthermore points out that even should it be possible to cause disintegration of the stones in the gall-bladder, it is exceedingly doubtful how much good would be thereby accomplished, since in this event the residual particles of the disintegrated calculi would remain in the gall-bladder and form the nucleus of new calculi. These are formed by the cementing together or incrustation of the disintegrated particles by newly precipitated bilirubin-calcium, the formation of which is favored by the persisting infectious inflammation of the mucous membrane, which gives rise to a secretion rich in calcium.

This reasoning is well borne out by clinical experience, since it is exceedingly doubtful whether, with any means at our command, we can cause solution of gall-stones in the gall-bladder. We now know that the thousands of gall-stones said to have been passed by the bowel after the administration of olive oil are merely masses resembling gall-stones in outward appear-

ances, and due to the basely deceptive powers of the olive oil acquired in its passage through the intestinal tract. We must conclude, then, that the solution of gall-stones is scarcely the object of rational treatment.

THE TREATMENT OF PUERPERAL ECLAMPSIA.

In the *Birmingham Medical Review* for October, 1906, SAVAGE gives a summary of the method of treating puerperal eclampsia as practiced at the present day. The practice of the Rotunda Hospital, Dublin, is described by De La Harpe. Veit's treatment by large doses of morphine is adopted, but induction of labor is never performed, and forceps are only applied in very exceptional cases and when the head is already on the vulva. The treatment consists in:

1. Morphine, half a grain hypodermic injection, followed by a quarter of a grain, and given, if necessary, every two hours up to two grains and until sleep is obtained.

2. A large amount of water is given to drink, or, if unable to drink, the stomach is washed out by three or four pints.

3. Two ounces of castor oil with three to four minims of croton oil.

4. The lower intestine is washed out by a rectal saline.

5. Diaphoresis is induced by covering with warm blankets.

6. Lying on side to prevent the saliva running down trachea.

7. Digitalis and atropine are given when necessary, on account of the weakening of the circulation and respiration.

8. Saline injections with phlebotomy in cases of plethora.

The statistics with this treatment show a mortality in the hospital of 16.9 per cent, whereas during the period before it was adopted, from 1889 to 1892, it was 35.3 per cent.

Robert Jardine, who advocates the treatment of puerperal eclampsia by saline diuretic infusions, says that by prompt purging with salts, the use of diuretics, and a milk diet, cases of marked dropsy and the albuminuria of pregnancy, when they have reached the stage of severe headache, and presumably, he says, within an ace of having fits, can be saved from having eclampsia by this treatment. He quotes six such cases with satisfactory results. On the other hand, he says, when the fits are occurring diuresis cannot be established quickly enough in the ordinary way, absorption by the stomach is almost in abeyance, and even if it were normal a good many hours would have to elapse before the action could be set up; hence the drugs must be given subcutaneously. For instance, in a comatose patient he pours four tablespoonfuls of salts into the stomach through a tube, gives an infusion of two pints, and applies a hot pack.

In the matter of the obstetric treatment, Jardine does not interfere if labor has not begun. During the first stage dilatation is left to nature if the fits cease, but if they recur he says the uterus should be emptied as quickly as possible. During the second stage delivery should be effected at once and under deep chloroform narcosis.

The mortality in the Glasgow Maternity Hospital, previous to fifteen years before (writing in 1901), by treatment with chloroform, chloral, bromide, veratrum viride, and morphine, was 47 per cent. Since the saline infusions have been added to the treatment the mortality has fallen to 17 per cent in over thirty cases.

A DISCUSSION OF OVER-NUTRITION AND UNDER-NUTRITION.

In a discussion of this subject contributed to the *British Medical Journal* of October 27, 1906, CHITTENDEN says he is of the opinion that the physiological evidence so far accumulated by dietetic experiment on man, reënforced by the more or less reliable evidence of thousands of individuals living at a lower level of proteid metabolism, indicates that the normal requirements of the body for proteid food do not demand more than one-half the amount called for by existing standards. In his judgment the daily consumption of proteid food, far beyond the amount required to maintain health, strength, mental and physical vigor, body weight, and nitrogen equilibrium, constitutes a form of over-nutrition as serious

in its menace to the health and welfare of the human race as many other evils more striking in character. He believes there are more people suffering to-day from over-eating, over-nutrition, than from the effects of alcoholic drink. Surely if people, as in his experiments, can maintain nitrogen equilibrium and body weight, gain in strength, show greater freedom from muscular fatigue, lose their rheumatic and gouty symptoms, regain a smooth and soft skin, exhibit greater freedom from colds, retain the normal hemoglobin content of their blood, and in every recognizable way manifest a good condition of health on a low proteid diet, why should we hesitate to accept the teaching which the scientific data point to?

DISEASES THAT SUGGEST SPECIAL DANGERS IN USE OF X-RAY.

To the *Journal of the American Medical Association* of November 3, 1906, EDSALL contributes a paper on this important theme. He points out that there are at present certain points in our knowledge that indicate that the most noteworthy dangers are to be expected in those diseases in which there would be particular difficulty in completely disintegrating and in excreting the products of the tissue breakdown that the *x*-ray causes; and two groups of disorders seem to deserve more careful consideration in this respect than any others with which we are as yet familiar.

One of these has become pretty well known. Clinical and pathological observation has shown that nephritis may follow *x*-ray exposures, and the enormous increase in excretion that sometimes follows exposure makes it evident that the kidneys are liable to suffer. From the occasional occurrence of nephritis, therefore, as well as from observations on metabolism, we must conclude that with those patients who already have nephritis or those whose kidneys are under especial strain *x*-ray exposures should be guardedly used or excluded.

The other group has been suggested to the author's mind by the fact that all the cases in which he has seen evidently serious results were already subjects of a considerable degree of toxemia. It would seem highly probable that a person already struggling with a toxemia would be more likely than a normal person to suffer ill effects to his organs of metabolism, as well as to his kidneys, if, in addition to his previous burdens, he were suddenly required to complete the disintegration and excretion of a large mass of broken-down tissue. It appears, therefore, that those who are to any noteworthy degree toxic from metabolic disorder or infectious disease should not be exposed without great caution and without urgent reasons.

It is probable that a third group with which we should proceed very cautiously is constituted by those cases that are very anemic. The tissue-destroying effect of the *x*-ray is so largely exerted on the blood-building organs that it might readily cause serious embarrassment if these organs are already insufficient, and the author has recorded two cases with pernicious anemia that became profoundly, indeed fatally, ill after one exposure. On the contrary, he observed two cases of the same disease that were benefited, one very greatly and rapidly benefited, by *x*-ray treatment, and it is possible that in some circumstances ordinary doses may destroy or at least seriously damage large portions of the blood-building organs, while in other circumstances the same dose may influence them favorably. It is possible, too, that toxemias may at times be favorably influenced, and it must likewise be admitted that the effect is not damaging in every case of nephritis, of marked toxemia, and of decided anemia, and particularly with those cases in which there is pronounced anemia in association with a distinctly toxic state. He believes that further clinical, metabolic, and other accurate studies of the contraindications, as well as of the indications, for the use of the *x*-ray constitute a valuable field of investigation, and it seems to be extremely desirable that clinicians make it a general custom to observe patients very carefully after *x*-ray exposures, in order to determine whether noteworthy after-symptoms seem to be common, even though the patients appear to be doing well under the exposures, and

particularly to make careful studies of the urine in a large number of cases. The result of such observation would not be to throw further discredit on the *x*-ray, but to make it possible to use it more rationally and with more logical judgment.

The author may not improbably be met with the objection from various sources that as yet there are but a limited number of dangers known to be associated with the use of the *x*-ray, and that the number of cases known to have been seriously damaged is small; but this objection may be met with sufficient force by the statement that the dangers of the *x*-ray have been recognized for only a comparatively short time, and that there has consequently been relatively little opportunity to determine how great and how numerous they are, and that in spite of this a very considerable number of cases that have been injured have been described. The histological studies and the studies of metabolism that have thus far been made make it wholly rational to expect that the dangers are more frequent than we yet know, and it appears to the author to be wise and proper not to belittle the dangers and attempt blindly to escape them, but to determine what they are and how they may be avoided.

ACCIDENTS DUE TO CHLOROFORM INHALATION.

A very interesting abstract of a recent paper on this important subject is to be found in the *Lancet* of November 3, 1906.

M. J. Tissot has undertaken an important research, which is recorded in the *Revue Scientifique* (5th series, tome v, Nos. 12 and 14), dealing with the causation of accidents occurring under chloroform. As he indicates, it is necessary before any clear understanding upon such a subject can be arrived at that we should obtain accurate knowledge about the mechanism whereby chloroform gains intimate access to the ultimate anatomical elements of the tissues of the body, and that we should be able to obtain trustworthy data upon the effects produced by definite quantities of chloroform in the arterial blood and in the tissues themselves. While investigating the conditions which control the passage of chloroform vapor contained in an atmosphere into the arterial circulation, Paul Bert came to the conclusion that percentages of chloroform vapor in air less than from 1.4 to 1.6 per cent were incapable of establishing anesthesia, while those above 2.4 per cent were liable to produce accidents and sometimes even death. Thus he obtained his well-known "workable zone" of atmosphere of chloroform vapor ranging in concentration from 1.6 per cent to 2.4 per cent. His determinations agreed with those arrived at independently by Snow, Dubois, and more recently in England by the Special Chloroform Committee of the British Medical Association. The absorption of chloroform from such an atmosphere into the arterial stream is determined, according to Bert, by the difference of tension between the two. Anesthesia would therefore be obtained when these tensions were equal and when chloroform was deported by the venous blood at the same rate as that at which it was conveyed to the arterial stream.

M. Tissot now points out that this theory can no longer be accepted, as Bert overlooked an important factor in the problem—the amount of the lung ventilation. M. Tissot asserts that while it is true that a 0.8 per cent will not induce anesthesia when the lung ventilation is feeble, yet when artificial respiration is practiced and the vigorous breathing thus produced leads to an increased actual intake of chloroform profound narcosis can be obtained. These experiments also demonstrate that even low percentages of chloroform vapor when given while full ventilation is insured produce not only profound narcosis but a fall of blood-pressure of from three to four cm. of Hg, and that the intoxication of the tissues is sufficient to determine a persistence of anesthesia lasting fifteen or more minutes subsequent to the cessation of inhalation. The experiments further show that when a percentage of 1.2 is used anesthesia is obtained only when artificial vigorous lung ventilation is practiced, and disappears after a time when normal breathing is resumed; 1.6 per cent barely suffices to render dogs insensi-

ble, but when vigorous artificial respiration is carried out by manual pressure upon the chest the animals are soon killed by this dilution of chloroform vapor. M. Tissot is thus led to enunciate one of his conclusions: the entrance of chloroform into the blood is determined solely by the tension of its vapor in the pulmonary alveoli, and not by the actual percentage value of chloroform in the atmosphere inhaled. The alveolar tension is lowered by the absorption of chloroform into the arterial stream after each inspiration, and is raised to a higher level when the pulmonary ventilation is increased. If this view is correct we may accept M. Tissot's practical commentary that it explains many of the deaths under chloroform which have occurred during the stage of excitement, when the breathing becomes both rapid and deep and thus brings about the fullest lung ventilation. It also explains the so-called "susceptibility" of dogs to chloroform, since these animals are very liable to rapid breathing during the induction period.

A further proof that Bert was mistaken in his view that at a certain period there occurs an equilibrium of tensions between the chloroform contained in the inhaled atmosphere and in the blood stream is afforded by M. Tissot, who by shaking blood in the presence of chloroform (1.6 per cent) found that 90 milligrammes of chloroform per 100 cubic centimeters of blood are taken up, the lethal dose of chloroform being from 60 to 70 milligrammes per 100 cubic centimeters of blood. It is reasonable to believe that Bert's theory that an equilibrium is established between the ingoing and the output of chloroform was based upon a fact which all workers have recognized, viz., that there is in all cases of ordinary surgical anesthesia a period of quasi- and unstable equilibrium. The breathing lessens in amplitude and the blood-pressure falls, so that the very conditions at which M. Tissot has arrived experimentally are brought about and the patient takes in less chloroform, while his tissues absorb less since the lung ventilation is diminished.

This state of quasi-equilibrium depends, M. Tissot believes, upon two factors—the rapidity with which the chloroform penetrates into the blood stream and the celerity with which it passes thence into the tissues. The diffusion of the chloroform from the blood and into the tissues is controlled by the duration of contact between the blood and the tissues; the relation subsisting between the quantities of chloroform in the blood and in the tissues; the rapidity of the circulation; and the actual nature of the tissue itself. The physical laws which govern the first two of these four factors have been investigated and are now recognized, but there has been less work undertaken to elucidate the last two, and M. Tissot has set himself the task of studying the problems which they present. In profound narcosis the circulation is considerably slowed, and as a result the blood in the pulmonary vessels absorbs a greater quantity of chloroform, while under these conditions the tissues take up more chloroform from the arterial blood. The actual amount of the anesthetic contained in the circulation and tissues thus becomes greater, and when the arterial pressure falls, as it does in deep narcosis, there is, if we accept M. Tissot's views, an increased danger of accumulation of chloroform when the blood-pressure is low. It has been long recognized that the nature of the tissues themselves plays a not inconsiderable part in determining the rate of absorption of chloroform by them, and that there is an affinity, if one may be allowed the term, between chloroform and certain constituents of the body. Pohl's reassertion that the lecithin-containing tissues possess this affinity in a marked degree has been confirmed so far as the nervous system goes by more recent observations and now receives the indorsement of M. Tissot.

Admitting the view advanced so strenuously by this writer that there is continuous and very definite accumulation of chloroform, that, in fact, it becomes "stored" in the tissues, we are bound to consider the effects upon the various tissues of the body of the passage of chloroform in and out of the organism. M. Tissot's view, and it is accepted in the main by other workers, is that during the period of induction the

chloroform tension increases in the arteries, then in the tissues, and in less degree in the veins. He asserts further, but here his work is not universally accepted, that the chloroform becomes "fixed" in the tissues and chiefly by those of the nervous system. Although the rate of absorption may vary from time to time owing to variations in blood-pressure, yet upon the whole this accumulation goes steadily forward and ultimately causes death when the chloroform tension reaches a certain and definite height. Bert's "safe zone" is brushed aside and definite proportions are safe only so long as we employ them in a diminishing scale when the narcosis is prolonged. We are told, rightly, that the effects of an anesthetic depend not upon the actual percentage of chloroform which is found in the arterial blood, but upon the amount which diffuses into the tissues, and especially into those constituting the nervous system. It is not an easy matter to determine the actual amount which must enter these tissues to determine anesthesia. Probably it is far less in amount than that which nine-tenths of patients inhale before becoming insensible, and the excess taken must depend to a great extent upon the method of inhalation adopted. When strong vapors induce rapid anesthesia M. Tissot tells us the tissues quickly become poisoned and remain on the verge of catastrophe until the inhalation is stopped and the veins withdraw from the tissues their excess of chloroform and deport it to the alveolar air, whence it is expired.

M. Tissot's results clearly demonstrate two sources of danger: the one arises either during excitement or reflexly, and consists in rapid and irregular breathing, which induces an unduly large quantity of chloroform vapor to be inhaled and fixed by the tissues in a unit of time; and the other the gradual accumulation of chloroform in the tissues which takes place during a prolonged inhalation of a non-lethal strength of chloroform vapors. The peril of an undue intake and of accumulation is accentuated, M. Tissot asserts, and his experiments appear to corroborate his view, when anesthesia is produced by large quantities of chloroform inhaled in a very brief space of time. The actual figures which he proposes are significant. In slow narcosis, such as from ten to twelve minutes, anesthesia is effected by from 32 to 38 milligrammes in 100 cubic centimeters of blood; in rapid narcosis the amount is from 50 to 70 milligrammes in 100 cubic centimeters of blood. In a medium case, from four to six minutes being taken for the induction, from 42 to 46 milligrammes are found. The dose of chloroform in the arterial blood does not necessarily as such determine fatal accidents, since, as has been pointed out, it is the amount of the anesthetic fixed in the tissues which is responsible for accidents, but indirectly the arterial blood being the vehicle by which the poison is conveyed to these tissues, it is important to know the relation between the dose which is competent to induce anesthesia and that which will destroy life. M. Tissot asserts that the lethal dose is double the anesthetic dose, and this statement is in harmony with the conclusions arrived at by Snow, Paul Bert, Dubois, Dastre, and many others.

Dealing with the mechanism of death from chloroform, M. Tissot's remarks are noteworthy, even though he has not attempted to review the work of other observers, if we accept his passing reference to that of Dastre and Morat, Richet, Knoll, and François Franck. The heart, M. Tissot believes, causes death. He regards primary heart failure as due to overdosage affecting the intracardiac nervous mechanism. The view that the heart muscle becomes directly affected does not find acceptance with him, although he advances no explanation of the acute dilatation which has been definitely described by others, and which appears to have been accepted by physiologists as proved. Nor does the reflex inhibition theory appear to impress this experimenter as having been conclusively demonstrated, although he favors the view that some subjects show an especial susceptibility toward chloroform, due, he suggests, to a peculiarity of their circulation or of the mucous membrane of their pul-

monary system. Secondary heart failure he regards also as always due to overdosage. In the one case it follows from excessive doses being administered when the breathing is abnormally full and abnormally deep; in the second it is due to accumulation of chloroform in the tissues; while in the third it is consecutive upon rapid and riotous respiration brought about by operative shock when the person operated upon is incompletely anesthetic.

We are not concerned at the moment with the practical advice concluding M. Tissot's paper, but his research calls for some comment. The salient points are involved in his attempt to prove that there is an accumulation of chloroform in the tissues. All thoughtful workers in this field of research have agreed long ago that the dangers of chloroform are the result of methods not infrequently employed. The risk of strong vapors rapidly inhaled is patent, and no one will be inclined to dissent from M. Tissot's dictum that all deaths from chloroform are due to overdose. We must of course carefully distinguish between deaths from and deaths under chloroform. Many deaths falling into the latter category have no causal relation with the anesthetic. But the possible danger of overdosage, even when dilute vapors are employed, has not been always studied or emphasized so well as by the writer of the papers which we are considering. It is matter of common observation, and inculcated, we believe, by the authorities, that the amount of chloroform required to induce anesthesia is many times larger than that necessary to maintain it. It has been shown also that so soon as unconsciousness is established the chloroform is conveyed away from the tissues. Again, for some minutes or even hours after an inhalation of chloroform has ceased the breath of the patient contains an appreciable amount of chloroform. These considerations all point to fixation of the drug by the tissues, and given their power to continue the absorption of chloroform it is not difficult to see how readily accumulation may lead to tissue poisoning and systemic disaster. If for no other reason M. Tissot's research deserves distinction in that it insists upon the importance of the rôle played by the tissues in the chloroform problem. We know at present comparatively little with exactness about the effects upon function caused by deterioration of tissues. It is permissible to assume that the resistive powers of tissues toward chloroform when lessened by disease or impoverished by physiological or pathological starvation will reveal themselves in various ways. The terms "caprice" and "idiosyncrasy" so glibly employed may express a very real pathological fact, and one with which the physician must reckon when he employs a drug like chloroform. In passing, we may indicate that this tissue depreciation probably causes the condition called "acidosis," or delayed chloroform poisoning (Guthrie), associated in some cases with chloroform inhalation. It is further noteworthy that the experiments of M. Tissot fall into line with much of the recent work upon chloroform dosage. If they prove anything, they demonstrate in the most convincing manner the danger of using strong vapors of chloroform and of compelling the patient by heroic doses to pass rapidly into insensibility. By strong vapors M. Tissot means those above 1.8 or 2 per cent. We think the necessity for slow anesthetization is at times overlooked. It should be slow, because the slowness, provided the inhalation is continuous, enhances the patients' safety and lessens their risk of after-complications.

SURGICAL RELATIONS OF THE PARATHYROID GLANDS.

MacCallum (*British Medical Journal*, Nov. 10, 1906) calls attention to the fact that the significance of the parathyroid glands, particularly in such conditions as tetany of digestive origin and in other autointoxications, is fairly well established. Ordinarily the loss of but one or even two of these glands is followed by no serious results, but a greater injury done to the glands or their entire removal occasions tetany. This is attributed to the form of intoxication ordinarily warded off by the parathyroid glands, whose function seems to

consist largely in the neutralization of poisons produced within the body and absorbed from without. The poison produced is certainly analogous to the tetanus poison, since it affects the central nervous system and so rapidly combines with the nerve cell as to be practically undemonstrable in the circulating blood. The parathyroid can neutralize this poison if it be injected in the form of the extract, though after complete thyroidectomy the sanitation of the animal can be maintained only with the greatest difficulty and by the injection intravenously of relatively large quantities of parathyroid material. This suggests that the treatment of postoperative tetany due to complete extirpation of the thyroid in the human is scarcely practicable excepting in mild cases, since the emulsion of extract of parathyroid must be introduced into the vein in considerable quantity, and the tetanic symptoms are extremely rapid and overwhelming in their development. In regard to the anatomy of the parathyroids, and this is of singular importance to the surgeon, Beebe writes most instructively.

There is, however, usually no great difficulty in recognizing them when they are seen, nor in distinguishing them from other bodies of the same size which may lie near, such as accessory thyroid lobules, bits of thymus tissue, lymph glands, or hemolymph glands. Some are as large as 1 centimeter in length by 4 or 5 millimeters in width, but many are very much smaller, and the average glands are perhaps 6 to 8 millimeters in length by 3 millimeters in width and 1 or 2 millimeters in thickness. They are flattened and usually elliptical or tongue-shaped, and quite soft. This soft, inelastic, flabby consistency aids greatly in distinguishing them from bits of thyroid tissue, which are much more firm and elastic, or from lymph glands, which are also much firmer. Their surface is always quite smooth and glistening, and except for the red lines of minute vessels, it is homogeneous in appearance, differing in that respect from the grayish-pink or red lymph glands, in the surface of which the opaque lymph cords can generally be made out as whitish-gray dots. In color they are of a clear, light brown, which may be rendered pale by anemia and the accumulation of fat, or converted into a brownish-red by congestion. It is particularly this bright-brown color, together with their flabby softness, which makes them easily recognizable.

Four may probably be regarded as the usual number, two occurring in apposition with each lobe of the thyroid; but the author's charts show many cases, as in Dr. Rogers's series, in which only three, two, or even one gland could be found. Doubtless there occur anomalous cases in which only two or three glands exist; but in many of these instances, if not in all, the remaining glands have increased correspondingly in bulk, and it seems probable that in most instances in which four glands cannot be found this result is due not to a real deficiency in the amount of parathyroid tissue, but to lack of energy and patience in the search for the rest of the glands.

Of 64 cases charted so far four definite glands were found in 36, three in 10, two in 15, and one in 3 cases. A number of these dissections were made by Dr. Whipple, but most of them by the writer, this attention to the parathyroids forming now a part of the routine autopsy technique. In practically all the cases the results of dissection were controlled by microscopical examination of the gland, although with some familiarity with the gross appearance this becomes entirely unnecessary.

The greatest diversity exists in different cases with regard to the position of these glands. So inconstant are they in their relation to any particular part of the thyroid or adjacent structures that any statement as to their usual position could not be anything less than actually misleading, unless couched in the most general terms. For example, we may say in general that the glands lie two on each side of the posterior or dorsal aspect of the thyroid gland, although, as has just been stated, it is often difficult or impossible to find both of them on each side, and on the other hand, one or more of them may not lie in this posterior region at all, but rather on the lateral aspect of the thyroid, or even upon the front of the trachea below the

thyroid. The recurrent laryngeal nerves which have been suggested by certain surgeons as a guide to their position do run in a general way in the region where they are most commonly situated, but the glands bear no definite relation to them, and frequently lie far away from the line of their course.

In most instances the lower of the two glands, which is usually the larger, lies near the posterior edge of the thyroid gland in the loose tissue which fills the notch in the branches of the inferior thyroid artery which enter the thyroid at that point. In most instances, too, the upper gland is found at the posterior edge of the thyroid, where it lies against the esophagus at the point where the superior thyroid artery fades away along the posterior edge of the thyroid. Usually, but not always, they are symmetrically placed on the two sides.

This may be regarded as the typical arrangement, of which others are variations, and in reviewing the charts it is seen that in 19 or 20 cases this is almost precisely their position. It is very common, however, to find the lower glands lying quite below the lower pole of the thyroid in the loose tissue, or upon the posterolateral surface of the trachea. Again, it is not uncommon to find the upper glands displaced from their position near the upper pole of the thyroid, and lying lower down among the branches of the inferior thyroid quite near the lower glands. Various irregular combinations of these relations occur, and sometimes one or other of the glands is found quite widely separated from the thyroid. On the other hand, it is rare to find them very intimately connected with the thyroid, and Beebe has not seen any embedded in its substance, although that is a common enough condition in the dog. The thyroid, as is well known, is closely enveloped in a dense but rather easily torn capsule, from which trabeculæ run into its substance. Outside this there is a quantity of very loose areolar connective tissue which often contains much fat, and it is in this tissue that the parathyroid glands usually lie. It is nearly always possible to lift them up from the thyroid, and to see that they are quite separate from its proper capsule, and in so doing there is brought to view the stalk of minute blood-vessels which spring, in the case of the upper gland (unless it is greatly displaced), from the superior thyroid, while those supplying the lower gland arise from a branch of the inferior thyroid artery.

From this it is seen that, provided the position of the parathyroids can be ascertained, it should be possible to remove the thyroid lobe without simultaneously removing them or even cutting off their blood-supply. It is obvious, however, that in order to do this one must avoid the ligature of the arteries at a distance from the thyroid, and indeed it is safer, if possible, to leave the posterior part of the thyroid with its intact blood-supply.

At best this preservation of the parathyroids offers difficulties, and in conditions in which the thyroid is greatly enlarged and surrounded by adhesions the difficulties may be very great; but the end is much to be desired.

With regard to another point in the surgical relations of the parathyroid glands the writer wishes to make some remarks here, since he has apparently been somewhat misunderstood in England in what he has already written. He refers to the relation of the parathyroid glands to exophthalmic goitre.

The possibility that this condition might depend upon an insufficiency of these glands was first suggested by Gley and acted upon by Moussu, who administered parathyroids to a patient suffering with the disease.

The author discussed the subject in a paper in 1903, without being able, from the material then at his command, to decide definitely for or against the idea. Two or three parathyroid glands removed with the thyroid and rather badly treated before being examined microscopically appeared to be atrophic, while others seemed normal in structure if rather small in size. Benjamins had found normal glands in his cases. Since that time nine cases have been examined, and the parathyroids found practically normal in all. They show in some instances a moderate atrophy of the cells and increase

in the interstitial connective tissue, but the alterations do not seem to be constant nor sufficiently extensive to support the idea that the parathyroids have anything to do with the development of the disease. The infiltration with fat, which has recently been described by certain English writers, is a well-known normal condition in these glands.

THE ROUTINE TREATMENT OF SYPHILIS WITH INTRAMUSCULAR INJECTIONS OF MERCURY SALICYLATE.

PALMER (*Boston Medical and Surgical Journal*, No. 17, vol. clv, 1906) holds that mercury salicylate possesses the advantage of causing no gastrointestinal irritation. Painful nodosities at times develop at the site of injection, though these are of minor import. The slow conversion of mercury salicylate into a soluble salt and its subsequent absorption allows the injection of a considerable quantity of the drug at one time, thus necessitating but one visit a week to the physician. One of the disadvantages attendant on the injection of salicylate, or indeed upon any insoluble form of mercury, is that incident to what is supposed to be pulmonary embolism. Half a minute after injection the patient experiences a dry cough, accompanied by a feeling of tightness in the chest, faintness, nausea, and air hunger. The cough usually persists for several days, during which time the sputum may be blood-tinged. Fatalities have been reported. Syncope is sometimes observed in nervous patients. Injections are usually driven into the gluteal region on account of the great mass of muscular tissue in that locality. Occasionally the interscapular region is employed, but then for only two or three injections. Each buttock should be divided into six or more injection sites. The injection should be administered alternately on either side. Liquid albolene is considered the best suspension medium, 1 part of the salicylate being employed to 10 parts of the fluid. Sterilization before use is not necessary, since abscesses do not develop when the suspension is freshly prepared and injected immediately without previous sterilization. None the less nodosities are likely to be frequent when the solution is kept for a long time and is not sterilized.

Any form of syringe may be used, but the piston should be provided with a check screw so that the dose may be accurately graded. The needle should be about 1¼ to 1½ inches long and of 21 gauge size. The patient is placed face downward upon a suitable table and the site for injection is selected. The horizontal position is to be preferred as the gluteal muscles are more relaxed in this position. The portion of the buttock selected is thoroughly rubbed with a mixture of equal parts of alcohol and ether, and the piece of gauze used for this purpose is left in place while the physician thoroughly shakes the bottle containing the injection fluid in order to make the suspension as complete as possible. Somewhat more than the amount to be injected is drawn into the syringe, and the needle is then attached. The syringe is inverted, and any air bubbles are expelled together with sufficient suspension fluid to make the amount in the syringe the exact quantity desired for administration. The gauze wipe is then removed and the needle is plunged quickly into the gluteal muscles for 1 to 1½ inches, depending upon the musculature of the individual. This must be done with extreme rapidity and by a sudden stab, since thus no pain will be inflicted. The syringe is at once detached from the needle; its lumen is watched for half a minute to make sure that a vein has not been punctured. Should bleeding be free the needle is reinserted; if not, the syringe and the needle are connected and the suspended salicylate is slowly injected into the tissues, whereupon the needle is removed and the place massaged for fifteen minutes. Primary injections consist of ½ grain of the salicylate or 5 minims of the 1-to-10 suspension. The first injection is generally followed in two days by a second injection of ¾ grain. In four days 1¼ grains is administered.

It is stated that in order to treat syphilis properly the patient must be kept on an amount of mercury a fraction of a grain less than the quantity known to produce symp-

toms of mercurialism, and it is always better to produce a slight gingivitis or other symptom of mercurialism, and in this way to find out how much mercury is necessary to keep the patient under control, instead of giving smaller doses without a knowledge of the patient's tolerance. In three-fourths of all patients 1¼ grains every seven days will suffice to keep the patient under control. At times this dose will have to be materially increased.

PSEUDARTHROSIS AFTER FRACTURES OF THE FOREARM.

Although failure of union is very rare after typical fracture of the radius, it is common in all other fractures of the radius or ulna, and this is due, according to FRAENKEL (*Münchener medicinische Wochenschrift*, No. 43, 1906), to the ease of rotation in these bones.

He proposes to correct the tendency to rotation, in cases treated by operation, by cutting the upper ends of the bones into a wedge, which fits in a corresponding notch cut in the lower. This groove and notch is made transversely in the radius and anteposteriorly in the ulna, thus preventing motion in either direction. In one case of severe injury to the lower forearm with loss of power of pronation, and ununited fracture, the above method was used on the radius, but a simple transverse resection on the ulna. The radius healed, but the fracture of the ulna left a false joint, which not only did not weaken the wrist, but gave it again the power of pronation which had been lost. The author suggests that perhaps cases with loss of rotation might be cured by the resection of the lower end of the ulna and the formation of a false joint there.

TUBERCULOSIS OF THE PROSTATE AND BLADDER.

Spontaneous cure is very rare in this condition, and, according to GUISY (*Annales des Maladies des Organes Génito-urinaires*, No. 18, 1906), operation should be performed whenever possible.

The condition is usually complicated by tubercular lesions either in remote organs or in the urinary system, which make operation futile. Of 269 cases of surgical tuberculosis, 183 were genito-urinary, and 86 of these were in that system alone. In 41 the urinary system was affected, in 29 the genital, while 15 were limited to the prostate and seminal vesicles. The general health may be good, unless the testicles are badly diseased, in which case premature senility appears.

As regards treatment, the only effective measure is extirpation, injections of various substances having proved useless. If only the prostate and seminal vesicles are affected the best route is the perineal. The vesicles should be removed even if apparently healthy, as removal tends to check the spread of the disease. Even though the vesicles alone are diseased it is safer to remove the prostate too. The latter is excised through the perineum. If the bladder is affected it should be opened above and its lesions should be excised or cauterized. If one kidney is tubercular, it should first be removed and the lower lesions not touched until after healing of the wound. If both the bladder and a kidney are diseased, it is best not to operate. The operation should be performed as soon as the diagnosis is made, as other treatment is ineffective even in the earlier stages.

LUPUS—TREATMENT WITH X-RAYS AND RESORCIN.

Better results than can be obtained by either of these agents alone are claimed by REINES (*Berliner klinische Wochenschrift*, No. 35, 1906), who believes that an application of resorcin prepares the tissues for the action of the rays.

Resorcin, as a 33-per-cent ointment, is spread on linen and applied to the affected part by means of a bandage. In twelve hours it is removed, and it is seen that the upper layers of the lupus patch are grayish-white and so soft that they can be rubbed off with a piece of gauze wet in sublimate solution. The paste is then reapplied and the process continued for five to six days. Boric salve is then applied for a few days, and the process repeated until the patch is healed. If a space larger than the palm of

the hand is never treated at once, and no salve stronger than 33 per cent used, there is no danger of poisoning. The outer layers being thus removed the *x*-rays have a better chance to act. The removal of the tissue after use of resorcin should be as great as can be done without pain. When a weeping surface free from epithelium is exposed, the rays are begun with medium hard tubes and 30-centimeter spark-gap. The exposure lasts ten minutes. The resorcin treatment is continued at the same time.

SPINAL ANESTHESIA—3000 CASES WITH TROPACOCAINE.

No bad effects were seen in the entire series of cases reported by SCHWARZ (*Presse Médicale,* No. 64, 1906), who has himself used the substance 1000 times.

The headache and nausea were no more marked than after simple spinal puncture, and no dangerous effects were seen. The technique differs from that usually employed, in that the tropacocaine in powder was placed in a sterile glass, and the spinal fluid being drawn into the glass dissolves the substance, no water being added. For operations on the legs and perineum, ¾ grain suffices, but for the abdomen 1 grain is required. It should not be used in children less than fourteen years old, although old age is not a contraindication. As it lowers blood-pressure it may be dangerous in persons whose pressure is already low. Increased extent of anesthesia must be obtained by raising the pelvis and not by increasing the dose.

DIFFICULT LABOR FOLLOWING VENTROFIXATION.

In the case reported by HOCHEISEN (*Berliner klinische Wochenschrift,* No. 35, 1906) labor was made impossible by the distance of the os uteri from the vulva.

Examination showed that the os uteri was placed far up and behind, and it was not possible to reach it with the finger or to bring it in view in a speculum. It was absolutely hopeless to expect natural delivery, and the choice lay between Cæsarian section, opening the abdomen and trying to replace the womb after severing adhesions, which has yielded no good results, and section of the anterior uterine wall and extraction of the child through the pelvis. The last way was decided upon, in spite of the danger of wounding the bladder, as infection was feared, the amniotic fluid having escaped thirty-six hours earlier. The only difficulty in the operation was in finding a knife long enough to reach beyond the bladder. Bleeding was slight, and the hand was easily inserted into the womb. As the wound could not be reached it was not sutured, but merely packed with gauze, which was removed the next day. The puerperium was normal.

HEAD OPERATIONS: CONTROL OF BLEEDING.

The loss of time caused by the bleeding of the scalp vessels is prevented by KREDEL (*Centralblatt für Chirurgie,* No. 43, 1906) by the use of metal strips. He uses flat strips, about one-fourth inch wide, curved to fit the head, and grooved on the convex side. The strips vary from two to three inches long and are used as follows: A long flat needle is passed through the scalp, down to the bone, at a point an inch from the intended incision, and passed along the skull parallel to this for a few inches and brought out through the skin again. A strip slightly longer than the course of the needle is laid on the scalp, and the strong thread which the needle carried is tied over it, compressing the scalp with its vessels between the thread and the strip. This is repeated until the entire intended incision is surrounded. In this way hemorrhage from the scalp may be entirely avoided.

SUPRAPUBIC CYSTOTOMY IN CHILDREN.

The chief interest in the case reported by MENDES (*Annales des Maladies des Organes Génito-urinaires,* No. 18, 1906) is the extreme youth of the patient, five months.

The author holds that lithotrity is not possible in such small children, at any rate if males, and perineal section is more dan-

gerous than suprapubic, so if there is a stone which demands removal, in a young boy, the only procedure is the suprapubic operation. In childhood the bladder rises higher than in later life, so that the operation is easier. The wound was sutured without drainage and recovery was uneventful.

TUBERCULOSIS OF THE TESTICLE—RESULTS OF CASTRATION.

The report of BECK (*Deutsche Zeitschrift für Chirurgie,* lxxxiv, 1) is based on 62 cases, of which 13 were bilateral. In 34 of these other parts of the genital system were affected, in 12 the urinary organs, and in 12 there were no other lesions noted.

Of the unilateral operations, 33 have been traced, and of these 15 are cured, 8 have died of tuberculosis, and 9 have had recurrence in the other testicle. After three years there is no more danger of recurrence. Of the bilateral cases 9 can be traced, and of these 2 are cured and 6 have died. The association of tuberculosis of the epididymis and of the prostate is not nearly so serious as that with tuberculosis of the urinary tract. In more than half the cases disease of the prostate recovers of itself after castration. Of the 12 cases with disease of the urinary organs (bladder), only one was cured. The fact that tuberculosis of the prostate heals after removal of the testicles, and the greater frequency of uncomplicated disease of the epididymis, show that the process begins in the testicle and extends along the canals in the direction of their normal flow.

CONTRACTED PELVIS—BEST CONDUCT TO FOLLOW.

The conduct of labor in women with contracted pelves was discussed by the last Congress of Scientists at Stuttgart (*Centralblatt für Gynäkologie,* No. 44, 1906), and most of those present favored the induction of premature labor.

This method gives very good chances for the life of the child—in fact, recent figures show a larger mortality among the children delivered by Cæsarian section. Pubiotomy is not spoken of quite so highly, but on the whole is to be preferred to section whenever it is possible. Version is only to be performed when the soft parts are relaxed. Premature labor may be performed in flat pelves of not less than 7 centimeters conjugate, and in generally contracted pelves of not less than 8 centimeters. Some of those present attacked this method on the ground that the indications were not clear, but on the whole the congress favored premature labor as the operation of choice, with pubiotomy as the second, but only under circumstances permitting a perfectly proper and aseptic technique.

FACIAL PALSY—OPERATIVE TREATMENT.

The anastomosis of the facial nerve with the root of the hypoglossus or of the accessory is considered by BERNHARD (*Mittheilung aus der Grenzgebiete,* xvi, 3). He finds that the benefit from the operation is most marked in its removal of those conditions due to the loss of muscle tone, such as drooping of the corner of the mouth and dribbling of saliva. The complex motions of expression are not much restored, smiling, etc., still causing marked distortion of the face. The hypoglossus is the best nerve to select.

TREATMENT OF ANTHRAX.

LENGFELLNER (*Münchener medicinische Wochenschrift,* No. 43, 1906) notes that the conservative treatment of anthrax is gaining ground daily. By conservative treatment he means leaving the pustules absolutely undisturbed, the protection of the surrounding surface by an unirritating salve which also prevents friction upon the parts of the bandage, and splinting and suspension of the involved extremity. This enables the tissues themselves to resist the spread of infection. The author contributes a tabulation of fifteen cases in which the diagnosis was confirmed by microscopic and bacteriological examination. All of these cases recovered. He notes that in one-third of the cases the arm was involved, in one-fifth the neck, in one-fifth the hand, and in one-third the face.

REVIEWS.

PREVALENT DISEASES OF THE EYE. By Samuel Theobald, M.D. W. B. Saunders Company, Philadelphia and London, 1906. Price $4.50 net.

Recent years have seen a great increase in the number of works on special branches of medicine designed particularly for the medical student and the general practitioner, the latest addition to the list of volumes on diseases of the eye being the book before us. The author condemns most of the treatises which have been written for this class of the profession, believing that they are "adapted not to their needs, but to the requirements of the specialist in this department of medicine." While it is possibly true that many of the books designed for the physician in general work fail in many important particulars, it is doubtful if the author of the present book has succeeded in presenting a volume that will meet the requirements any better than or so well as the works which he condemns. In the preface the author states that "he has not thought it desirable to encourage the general practitioner to rely upon the ophthalmoscope as a means of diagnosis," and therefore "has not even given a description of it or explained its use." In view of this statement it is rather surprising to find considerable space devoted to the diagnosis and treatment of diseases of the retina, choroid, and optic nerve, conditions that are only recognized and differentiated by the ophthalmoscope. And yet a treatise on eye diseases should include affections of this nature. Books on special branches of medicine serve most frequently as reference works, and under such circumstances the complete and concisely written work which serves as a guide in the simpler affections is none the less valuable because it describes diseases which the physician may not be willing or competent to treat, but of which a knowledge is of interest and value.

The author's descriptions of the various ocular conditions are clearly presented, and the essential points of difference of affections with somewhat similar symptoms and appearances fully emphasized. The illustrations accompanying the text have been well chosen, while the full-page colored drawings of external inflammations are unusually good, and should be of considerable service in differentiating the various types of ocular disease. In the forms of treatment advised the author gives those measures which he has found of service, although in a number of instances his views are somewhat at variance with the experience of others. This is especially noticeable in the matter of operations. In enucleation he adheres to the old-fashioned operation, condemning the bringing together of the conjunctival wound and the stitching of the severed muscles as "finicky" procedures, although operators of experience consider that these measures insure a more movable stump for the artificial shell. Tenotomy is given the preference over advancement of the ocular muscles in the operative treatment of squint, and even in divergent squint the cutting of both external recti muscles is advised, although in the latter condition the primary fault is most frequently weakness of convergence and not excessive diverging power. The transplantation operation in the treatment of pterygium is not mentioned, notwithstanding that most operators believe it to be superior to excision in large, fleshy growths, as it is not so likely to be followed by recurrence.

W. M. S.

THE PRACTITIONERS' MEDICAL DICTIONARY. By George M. Gould, A.M., M.D. Copiously Illustrated. P. Blakiston's Son & Co., Philadelphia, 1907. Price $5.00.

Dr. Gould's contributions to medical literature are exceedingly numerous and vary widely in their scope and character. We are glad that the best that he has done has been most appreciated by the profession, for the publishers tell us that before the issuance of the present work over 200,000 copies of Dr. Gould's other medical dictionaries had been sold. At the present time,

as we understand it, there exist four dictionaries by Dr. Gould: one the large illustrated Dictionary of Medicine, Biology, and Allied Sciences, the cost of which is $10; a Dictionary of New Medical Terms, the cost of which is $5; the Students' Medical Dictionary, the cost of which is $2.50; the Pocket Pronouncing Medical Lexicon, the cost of which is $1; and lastly, this Practitioners' Medical Dictionary, which is intermediate in price between the ten-dollar illustrated dictionary and the students' dictionary at $2.50.

The present volume appears in a flexible binding and covers 1043 pages. In other words, it is the large dictionary boiled down to a smaller compass; the paper is thin, the type closely set, and the volume is therefore very much smaller than many other books which contain precisely the same amount of information. Personally we would prefer using the larger dictionary and recommending the much smaller one for students, but the author and the publisher evidently believe that a dictionary occupying a middle position both in size and price is in demand. The present dictionary includes all the words and phrases generally used in medicine, with their proper pronunciation, derivation, and definition. Many of the tables which are in the larger dictionary are of course left out of this one, and but few illustrations are included, and these are not particularly apt. Most of the profession are familiar with Dr. Gould's dictionary in one form or another, and this familiarity forces them to recognize that any lexicon compiled by him must be well worthy of purchase.

DISEASES OF THE EYE. A Handbook of Ophthalmic Practice. By G. E. de Schweinitz, M.D. Fifth Edition, Thoroughly Revised. Illustrated. W. B. Saunders & Co., Philadelphia, 1906. Price $5.00.

Dr. de Schweinitz's work upon ophthalmology, designed at once as a text-book for the student, a reference book for the ophthalmic surgeon, and a manual for the general practitioner, has, in a comparatively short period, achieved the distinction of reaching its fifth edition, and has been warmly commended by reviewers not only in this country but in England, being classed as one of the best text-books upon this subject in existence here or abroad. In the present edition much new matter has been incorporated and all the text carefully gone over. The portions of the book which deal with the pupil and its anomalies, the varieties of conjunctivitis and their treatment, tumors and cysts of the conjunctiva and unusual forms of keratitis, and in addition those dealing with injuries of the sclera and the detection of foreign bodies in the eyeball, have all been rewritten, as have also the chapters upon the pathogenesis and pathology of sympathetic ophthalmitis and the pathogenesis of glaucoma. A number of new illustrations have also been added, and much care has been taken to explain in sufficient detail and yet concisely the various remedial measures which the author thinks advisable in ophthalmic practice. The book bears the marks of three valuable points which are essential to the successful author: First, large practical experience; secondly, an intimate acquaintance with the literature of his subject in this and foreign languages; and thirdly, and by no means least important, the results of his own personal investigations from an original standpoint, both clinical and experimental. By long odds the leading American text-book on this subject in the recent past it will surely maintain its position in the future.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. For Students and Practitioners. By Hobart Amory Hare, M.D., B.Sc. Second Edition, Revised and Enlarged. Illustrated. Lea Bros. & Co., Philadelphia and New York, 1906. Price $5.00.

The following preface from the second edition is self-explanatory:

"In presenting the second edition of his text-book on the Practice of Medicine the author desires to express his appreciation of the cordial reception of the work since it first appeared, a reception which necessitated its being repeatedly put to press.

"The present volume, prepared for the physician and student of medicine, embodies the experience of more than twenty-two years of active hospital and private practice, during which time the author has been constantly teaching the subjects of clinical medicine and therapeutics. With this experience

he has attempted to present the facts which the practitioner needs and which the student must thoroughly grasp if he is to be successful in gaining his degree and in practicing his art.

"In the preparation of many portions of the work careful collections of statistics have been made, and these have not infrequently given results which add materially to our conception of the frequency of certain diseases at different periods of life, of the relative frequency of different symptoms, and the value of certain plans of treatment.

"Particular pains have been taken to present methods of treatment clearly and in such a way that they may be put in practice.

"Much information that might be included, which deals with subjects which are still uncertain and debatable, has been excluded.

"Warm thanks are due Dr. W. M. L. Coplin, Professor of Pathology in the Jefferson Medical College, for valuable suggestions and criticisms, in which he has shown not only a complete grasp of his own department of medical study, but intimate knowledge concerning the latest developments in clinical medicine.

"The author also desires to acknowledge the valuable suggestions, made during the preparation of this edition, of Dr. Aller G. Ellis, Demonstrator of Pathology, and Dr. Alfred Gordon, Instructor in Neurology, in the Jefferson Medical College.

"The fact that the United States has, within the last few years, become possessed of territory in the tropics has greatly increased our interest in the many tropical diseases heretofore scarcely known by practitioners in the temperate zone, and the investigations by surgeons in the Army, Navy, and the Public Health and Marine Hospital Service have thrown much light upon these affections. Further than this, the investigations by English physicians have broadened our views very greatly as to tropical disease. As troops returning from tropical service often bring with them manifestations of these diseases, it behooves every practitioner to be able to recognize and treat such conditions. It seems appropriate, therefore, that a modern work on medicine should contain chapters on tropical medicine, the more so as lectures upon this subject are now given in many of the great medical schools.

"In the preparation of this second edition great care has been taken to embody the latest views that have received general acceptance as being scientifically and clinically correct, it being constantly borne in mind that the needs of the student and practitioner will be best met by excluding statements open to criticism and presenting facts which will prove useful in practice."

PRACTICAL DIETETICS WITH REFERENCE TO DIET AND DISEASE. By Alida Frances Pattee. A. F. Pattee, New York, 1906. Price $1.10 by mail.

When the first edition of this book appeared we reviewed it in terms of praise, and the present edition possesses all the advantages of its predecessor. The book is crammed with a large number of excellent dietetic suggestions and recipes for the preparation of various foods and drinks that are suitable for the sick. It is marred by containing a large number of pages in the back portion devoted to advertising purposes. In other words, this portion of the book closely resembles one of the ordinary journals of the day. However, as many of these advertisements deal with things which are useful to the physician who is especially interested in the dietetics and the feeding of infants, they are not really objectionable.

THE HARVEY LECTURES. Delivered under the Auspices of the Harvey Society of New York, 1905 and 1906. The J. B. Lippincott Co., Philadelphia and London, 1906.

This small octavo volume of a little over three hundred pages contains the Lectures which were delivered before the Harvey Society of New York, which society was organized by a number of New York physicians. The lecturers include men who are well known in the profession as being original investigators in this country and Europe, and number thirteen. The first one deals with the theory of Narcosis, by Professor Hans Meyer, of Vienna; this is followed by one upon Modern Problems of Metabolism, by von Noorden; and another

upon Trypanosomiasis, by Dr. Novy. Others follow by Dr. Park, of New York, upon Serum Therapy, and by Dr. Mendle, of Yale, upon the Formation of Uric Acid. Another follows upon Some Phases of Tuberculosis, by Professor Theobald Smith, and lastly is that of Dr. Howells upon the Cause of the Heart Beat.

A Pocket Formulary. By E. Quin Thornton, M.D. Eighth Edition, Revised. Lea Bros. & Co., 1907.

As Dr. Thornton is a graduate in pharmacy, an active practitioner of medicine, and Assistant Professor of Materia Medica in the Jefferson Medical College, he is possessed of a training which well qualifies him for the compilation of a series of prescriptions which will prove useful to the general practitioner. In this formulary the diseases are arranged alphabetically, and under each disease is placed a number of prescriptions which Dr. Thornton thinks are useful in the particular condition under consideration. The book is about the size of the ordinary visiting list, and can be readily carried in the pocket.

Medical Diagnosis. A Manual for Students and Practitioners. By Charles Lyman Greene, M.D. P. Blakiston's Son & Company, Philadelphia, 1907. Price $3.50.

This comparatively small book on Diagnosis, which closely resembles in its form the well-known manual of "The Practice of Medicine" by Hughes, which was published by the same firm, has been prepared by Dr. Greene, of St. Paul, Minnesota, in order to provide students and practitioners with a brief and "thoroughly modern" handbook of convenient size for studying diagnosis. It is all that it claims to be, is carefully prepared, accurate, and the text shows that the author has carefully consulted contemporaneous literature in its preparation. To those desiring one of the smaller books upon this subject it can be cordially recommended.

Abdominal Operation. By B. G. A. Moynihan, M.S. (London), F.R.C.S., Leeds. Second Edition, Thoroughly Revised. W. B. Saunders Co., Philadelphia and London, 1906.

This book, printed on exceptionally fine paper, in large, clear type, and admirably illustrated, is the clearest, most rational, most readily understood work that has yet appeared on abdominal surgery. Both in the preface and in the text Moynihan freely acknowledges the debt which he, and indeed all surgeons, owe to the work of W. J. Mayo, J. B. Murphy, and Mayo Robson.

The book is one which must be studied by every practicing surgeon, and to which it is impossible to accord too high praise. A detailed review would simply indicate an acceptance, an adoption, and a clear exposition upon the part of the author of all that is best in modern surgery.

Surgery: Its Principles and Practice. By Various Authors. Edited by W. W. Keen, M.D., LL.D. Volume I, Illustrated. W. B. Saunders Co., Philadelphia and London, 1906.

The first of the five volumes of surgery opens with a historical sketch by Mumford. In this the lives and work of Hippocrates, Galen, Vesalius, Pare, Albrecht von Haller, John Hunter, Joseph Lister, and about thirty American surgeons are briefly considered. This section of the book may be considered as a series of truly admirable biographies rather than as a systematic sketch of surgical progress.

Surgical physiology has been allotted to Crile, who because of the laboratory and clinical work he has done in this line is best fitted to make the practical application of its principles.

John C. Da Costa, Jr., contributes a chapter upon examination of the blood. He is evidently skeptical as to the absolute value of cryoscopy in determining the question of nephrectomy, following in this respect the teaching of Rovsing rather than that of Kümmel. The cellular elements of the blood are pictured and accurately described. The chapter closes with an extremely valuable discussion on special surgical hematology.

Hektoen writes on infection and immunity, discussing this question from the theoretical and laboratory standpoint, and clarifying, so far as this is possible, a study in which the ordinary reader shortly becomes lost in a maze of recently coined words.

Adami takes up the subject of inflammation from the standpoint of the pathologist.

His chapter closes with a section on the treatment of acute inflammation.

Freeman writes on suppuration, abscess, and fistula, but does not include in his work the results of the comparatively recent researches upon the staphylococcus albus. In the remarks upon treatment of abscess he very properly cautions against the unnecessary squeezing and scraping of the abscess walls after incision. He states that he has seen pyemia result from such practice. As to Bier's passive hyperemia, Freeman holds that its strongest indication is to be found in cases of chronic inflammation and suppuration, particularly when they are tuberculous in nature.

The treatment advised for carbuncle is ablation of the entire lesion by an incision carried through sound tissues, followed immediately by skin-grafting.

The section devoted to abscess, ulceration, and ulcers is a brief but most satisfactory discussion of the symptomatology and treatment of these affections. In his section on senile gangrene, Freeman advises immediate amputation when the gangrenous process extends to the sole of the foot, and rather favors section at the lower part of the thigh, since here the tissues are amply nourished by branches from the deep femoral.

The process of repair is considered by Francis Carter Wood. He notes that after injury the regeneration of the nervous tissues of the brain or spinal cord does not take place to any considerable extent. He states that partial functional restoration has been noticed in a few cases of complete transverse lesion of the cord after prompt union of the separated ends by suture, and attributes this to fibrillar regeneration, which he describes as taking place in the anterior and posterior portions of the cord and originating from the gray substance of the anterior horns. He considers wounds of the serous surfaces under a general heading, but does not explain the difference in resistance to infection or reparative power exhibited, for instance, by the pleura and the peritoneum.

The chapter on thrombosis and embolism, by Charles H. Frazier, considers exhaustively the pathology of these affections. Thereafter there is discussed the symptomatology as affecting individual vessels. Postoperative thrombosis, particularly in its relation to appendicitis, is dealt with at length. Attention is called to the comparative frequency of pulmonary embolism after injuries and operations. The section devoted to air embolism is a monograph in itself. Frazier deals very practically with erysipelas and tetanus, and contributes a brief, but from the surgeon's standpoint admirable, chapter upon scurvy.

Eugene Alfred Smith discusses traumatic fevers. He classifies them as aseptic and septic; the latter are further subdivided into septicemic and pyemic. Such terms as autoinfection and sapremia he rejects as absurd in the first instance, and confusing in the second.

Edward Hall Nichols writes upon rickets, illustrating his text by some admirable illustrations.

John Chalmers Da Costa contributes the section on surgical tuberculosis, beginning his article with a historical sketch and continuing with the conditions that predispose to infection, tuberculous abscesses, diagnosis of tuberculosis, tuberculosis of the skin and of other tissues and organs.

Chancroid and syphilis are briefly considered by Edward Martin.

Bland-Sutton contributes an excellent section upon tumors.

The first volume ends with a chapter upon wounds and contusions by Crile, including a section upon shock and collapse.

This brief résumé of the subject-matter of the first volume of Surgery, contributed by men particularly fitted for the work and molded into a symmetrical whole by an editor as skilful as is Keen, indicates a completed work which will rank with the best.

A Treatise on Surgery. By George Ryerson Fowler, M.D. Illustrated. W. B. Saunders Co., Philadelphia and London, 1907.

This work of Fowler's accentuates the sense of loss experienced by American surgeons in the death of the distinguished author, since there will be found embodied

in these two volumes all that is best of surgery. They possess the merit, lacking in systems, of having been written by one man, hence there is an even balancing which is especially desirable from the standpoint of the student, and is refreshing even to the busy surgeon.

The first part of the book is devoted to setting forth the fundamental principles underlying surgery. These include inflammation in its constitutional and local manifestations and surgical bacteriology. Thereafter there follow chapters upon injuries and diseases of separate tissues, under which come the skin and subcutaneous connective tissue, blood-vessels, lymphatic vessels and lymphatic glands, fasciæ, muscles, and tendons, bones and joints.

The third section is devoted to gunshot injuries. Thereafter are considered acute wound diseases, chronic surgical infections, including syphilis, tuberculosis, actinomycosis, etc.

The seventh section is devoted to laboratory aids in surgical diagnosis and prognosis, and aids to surgical diagnosis in general; thereafter surgical operations in general, surgical anesthesia, general principles of operative technique, operations on individual structures, foreign bodies, and bandaging.

Regional sugery is next taken up, beginning with surgery of the head. A special section is devoted to surgery of the female pelvic organs.

There is an index of names, together with a very complete general index, with proper cross-references.

The work shows a wide knowledge of current literature, a wise choice of what is best and likely to be permanent in modern work, unusual facility for clear expression, and a teacher's knowledge of classification and condensation.

THE TECHNIC OF OPERATIONS UPON THE INTESTINE AND STOMACH. By Alfred H. Gould, M.D. Illustrated. W. B. Saunders Co., Philadelphia and London, 1906.

The firm of W. B. Saunders Company has produced a book not only admirable from the publishers' standpoint and because of the singular richness and adequacy of illustration, but thoroughly useful and practical for the purposes of the busy surgeon. Gould has embodied almost without exception the best of modern technique, has put this so clearly that there is no misunderstanding, and with rare judgment has so selected his pictures that they in themselves are almost sufficient without the text. There is no book published, excepting perhaps Moynihan's work, which will serve as a more useful guide than this. Its success is assured, nor can any operator well dispense with it.

Gould has been especially fitted for this work by a long course of experimental investigation, and has availed himself of the best in current literature. He has by no means endeavored to include all of the operations which have been advocated, but the reader can be quite certain of finding within these pages a complete description of the best.

A TEXT-BOOK ON THE PRACTICE OF GYNECOLOGY. By William E. Ashton, M.D., LL.D. Third Edition, Revised and Illustrated. W. B. Saunders Co., Philadelphia and London, 1907.

The third edition of Ashton's comprehensive work in itself adequately expresses the fact that the author has furnished a book which has answered the needs of both the specialist and the general practitioner. The alterations made are the introduction of the metric system, some additions to the illustrations, a revision of the chapter on blood in relation to surgery, a consideration of colonic lavage and its modern application, and some changes in the technique of operations which modern practice has indicated to be desirable, together with a practically new section upon intestinal anastomosis based upon Moynihan's admirable work.

Among chapters not always found in such works are those dealing with examination of the rectum, the *x*-rays in gynecology, hydrotherapy, constipation, diet, indoor exercises, saline injections, physiology, antisepsis in hospitals, antisepsis in private houses, appendicitis, and movable kidney.

In the more than one thousand pages which this book contains will be found included accurate, minute, and quite ade-

quate descriptions of all modern operations, together with an unusually full discussion of symptomatology and medicinal and hygienic treatment.

This book easily ranks with the best on the subject, and because of its completeness and the skill with which the last edition has been revised is likely to achieve even a wider popularity than has heretofore been accorded to it.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D., F.R.C.P.

The Royal Medical and Chirurgical Society is presumably nearing the termination of its existence as a separate entity among the learned societies of London. The practical details of the scheme for the amalgamation of the chief medical societies of London are fast being matured, now that the principle has been accepted. But in the evening of its existence this society shows no lack of vitality: an interesting lantern demonstration of the spirochæta pallida was given at a recent meeting by Dr. A. MacLennan, who had come from Glasgow for the purpose; and not the least interesting feature of his remarks was the obvious hesitation in accepting this organism as the specific cause of syphilis. Any one who has made himself familiar with the various organisms which observers profess to be able to distinguish from the spirochæta pallida, and which these observers admit to be found in many non-syphilitic conditions, must realize that the distinctions are so subtle that the specificity of any one spirochæta must not be accepted without question. But Dr. MacLennan pointed out other difficulties: syphilis has been inoculated experimentally, but the material used for inoculation has not contained the spirochæta pallida; this he suggested might be due to the fact that the organism assumes different forms at different periods of its life-cycle, and may be present in some form quite unlike the spirochæta stage, and as yet unrecognized. Then again congenital syphilis exhibits the spirochæta pallida in large numbers, and yet as every one knows the infectivity of congenital syphilis is so low that many clinicians who see very large numbers of syphilitic children have never seen a case of undoubted infection from congenital syphilis. In contrast with the large numbers of the spirochæta which are to be found in the lesions of congenital syphilis is the scarcity of this organism in the discharge from primary sores, and from secondary lesions of the skin or mucous membranes, the very lesions which are known to be the chief sources of infection. On the whole it seems difficult to accept Dr. MacLennan's position that although the spirochæta has not been established as the cause of syphilis, its presence can be taken as diagnostic of syphilis.

There has been much talk in London recently about the milk supply, especially with reference to infant feeding. A meeting was held at the Institute of Hygiene to protest against the use of chemical preservatives in milk, and there have been two prosecutions within the past few weeks in provincial towns for adding boric acid to milk or cream. The trade view would seem to be that either preservatives must be added or sterilization must be practiced; and indeed there is something to be said for such a view if it is true, as was stated last week by a witness in a trial in London for adulteration of cream with starch, that it is a common practice to keep cream in stock as long as four days before it is sold as fresh cream. Sterilization, however, is certainly not the ideal remedy, and when it became known that Mr. John Burns, the president of the Local Government Board, intended to introduce a bill into Parliament legalizing the establishment of municipal depots for the supply of sterilized milk for infants, a deputation was organized a few

days ago to wait upon this minister and to urge upon him the mischief of such a measure. The deputation included Sir Thomas Barlow, Sir Lauder Brunton, Dr. H. Ashby, Dr. Cheadle, and Dr. Eustace Smith. Sir Thomas Barlow acted as chief spokesman. He said that sterilization is only a second-best process, and might bring certain evils in its train; scurvy and rickets are liable to occur in children fed on sterilized milk; and when once milk has been sterilized it is no longer possible to test the goodness of the supply. The better alternative is proper refrigeration of the milk immediately after it is taken from the cow, sterilization of the vessels in which it is stored, and proper precautions to insure the milk being kept cool in transit. Sir Lauder Brunton followed in the same strain, and advocated the appointment of a joint committee from certain bodies—the National League for Physical Health and Improvement, the National Health Society, and the Infants' Health Society—to investigate the conditions of the milk supply for infants. The president of the Local Government Board adopted the customary attitude of cabinet ministers receiving deputations, namely, the attitude of non-committal; only on this occasion he seemed to imply that the deputation was not likely to influence any legislation on the subject.

It is always interesting to hear the pure physiologist discourse on the practical problems of medicine, for he brings to bear on them a knowledge of the subtler processes of life which we, alas! either know only second-hand or worse still have long reckoned amongst the things we "used to know." Professor Halliburton, the famous physiologist, has recently been addressing a lay audience at the Institute of Hygiene on "The Diet of To-day," and the habitual "diner-out" may be pleased to hear that it is safer to eat too much than too little. He was not inclined to agree altogether with Professor Chittenden's views as to the small amount of proteid food which is advisable; the minimum diet, he said, is not necessarily the optimum diet. The poor in large cities subsist like the vegetarian on a minimum quantity of proteid food, but both these classes of people prove weak in resistance to hardship and disease as a rule compared with people who are free consumers of meat; and the excellent results which follow an extremely liberal diet in various diseases, such as tuberculosis and some nervous disorders, are sufficient to show that a large amount of proteid as well as other food may be useful. The proteids of animal origin are, he said, easier of digestion than those of vegetable origin, and so even the vegetarian is obliged to allow the value of milk, cheese, and eggs. Professor Halliburton expressed some doubt as to the supposed abstemiousness of the Japanese in regard to proteid food, and thought that their recent prowess might be due to recent departure from their vegetarian habits.

At the Clinical Society this month Dr. Langmead reported a curious group of symptoms observed in three children during the past few years at the Children's Hospital, Great Ormond Street. In each there were recurrent attacks of tetany associated with chronic dilatation of the colon, and the stools were unhealthy and offensive. The youngest child was 2½ years, the oldest 6 years: all died of complications. It has long been known that tetany is associated with unhealthy conditions of the intestine, and these cases with dilatation of the colon support the view that tetany is due to some toxic absorption from the bowel.

Another condition which might well have puzzled the diagnostician was described at the Medico-Chirurgical Society a few days ago by Dr. West and Dr. Clarke. A woman aged thirty-seven years became cyanosed suddenly about eighteen months ago; since then she has remained cyanosed, the only other symptoms being headache, weakness, and constipation. There were no physical signs of any sort to explain the cyanosis; the spectroscope showed sulph-hemoglobin in the blood. Very few cases of this sulph-hemoglobinemia have been recorded before; its cause is unknown.

This week Dr. Charlton Bastian, who has for thirty years combated the now generally accepted doctrine *"omne vivum e vivo,"* has

again brought before the scientific world experiments by which he claims to have proved that certain low forms of life, such as bacteria, torulæ, and molds, may originate *de novo*. He heated solutions of ammoniacal salts, with no carbon present in the solution, up to temperatures ranging from 239° F. to 266° F. for ten to twenty minutes; the tubes containing the solutions had been hermetically sealed, and submitted previously to an even higher temperature. They were then exposed to daylight or placed in an incubator for periods varying from five weeks to four months; at the end of this time they were found to contain various microörganisms. Control tubes which were opened after only a few hours' incubation showed no microörganisms. But every bacteriologist is familiar with the fact that certain spore-forming microorganisms will survive exposure to temperatures far above boiling point, and it may be doubted whether Dr. Bastian's interesting experiments prove more than the difficulty of real sterilization of any fluid; but as usual the lay press has seized upon the pronouncement as a step toward the solution of "that insoluble problem, the origin of life."

The daily papers have been much occupied of late with the now notorious Edalji case, into which an element of medical interest has been imparted by the vigorous effort of Sir Arthur Conan Doyle, the author of "Sherlock Hôlmes," to prove that Edalji was innocent of the crime for which he has been imprisoned, namely, wanton maiming of cattle. Conan Doyle is himself a medical man, and he has relied much in his argument on the error of refraction which in his opinion would have made it impossible for this young man to go out at night without glasses and mutilate a pony as he is supposed to have done. Medical opinion seems to be divided on this point, but there appears to be a general consensus of opinion that it is highly improbable that this young Parsee, a quiet, studious lawyer, should have been guilty of the crime attributed to him. The judge is now public opinion, the legal authorities have long ago made up their minds, and it remains to be seen whether the genius of Sherlock Holmes can unsettle them.

THE TREATMENT OF SCARLET FEVER.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I have just read with much interest in the January, 1907, number the article on the use of chloral hydrate in the treatment of scarlet fever. I am not now in general practice and have had no experience with chloral hydrate in the treatment of this disease. According to the tables, although the death-rate was low, all of the plans of treatment were unsatisfactory, considering the time of treatment and the postfebrile nephritis.

I write to call the attention of your readers to the use of sodium sulphite in the treatment of scarlatina, so long ago recommended by Tyrrell. My plan of treatment was as follows:

1. Sodium sulphite ℥ss. Dissolve in twenty-four teaspoonfuls of water. Give a teaspoonful every hour. Give water before the dose, none after. Use the pure, dried, powdered drug. Dose according to age. The main point is to give large doses, and saturate the system as soon as possible.

2. Anoint the skin with phenol camphor 25 per cent; vaselin, white, 75 per cent.

3. Place a Bologna sausage skin filled with ice, wrapped in two or three folds of muslin, around the neck, holding it close under the angles of the jaws. An ice-bag would be more elegant, but it is not always to be had.

In this treatment we have an internal and external antiseptic and parasiticide, and an effective remedy for the angina. My experience with it has been that within two to four days the fever subsided, the inflammation of the skin disappeared, within a week or ten days the patient was well, and no kidney complications arose.

It would be well worth the while of physicians who are in the midst of epidemics to give this treatment a trial.

THOMAS A. ELDER, M.D.

WOOSTER, O.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., APRIL 15, 1907. | Third Series, Vol. XXIII, No. 4.

ORIGINAL COMMUNICATIONS.

SOME EXPERIENCES IN THE SYMPTOMATOLOGY AND TREATMENT OF THE TOXEMIA OF PREGNANCY AS BASED ON THE STUDY OF 78 CASES.[1]

BY WILLIAM H. WELLS, M.D.,

Visiting Gynecologist to the Mt. Sinai Hospital; Demonstrator of Clinical Obstetrics in the Jefferson Medical College; Assistant Visiting Obstetrician to the Jefferson Medical College Hospital, and Chief Clinical Assistant in the Out-patient Obstetrical Department of the Same; Fellow of the College of Physicians, Fellow of the Obstetrical Society, Member of the Pediatric Society, etc., etc.

The toxemia of pregnancy is as far as we know an autointoxication affecting pregnant women, the exact causes of which are as yet obscure. Apparently it arises from an incomplete metabolism of certain food elements, although other causes, such as pressure on the kidneys and ureters, microörganisms, syncytial growths, thyroid, hepatic, renal, or intestinal intoxication, have been given as causes; and no doubt any or all of these do play a part as causal factors.

Chronic gastrointestinal indigestion, gout, overfeeding or the reverse, starvation, the overuse of alcoholic stimulants, tea and coffee, sudden grief, worriment, all act as predisposing causes.

A not uncommon predisposing cause seems to be a sudden chilling of the skin of a pregnant woman by exposure to cold and damp, the patient previously not having been excreting well.

It would seem probable that the fetus or its appendages, or both, have some causative relation to the production of the condition.

Symptoms.—In the records of 78 cases, the average time of most frequency was between 7½ and 8½ months.

Recently I have treated a well-marked case, the symptoms beginning at the twelfth week. As the symptoms have almost become classical I need only touch upon them. Headache I have found present in the majority of patients treated. This headache is usually frontal, and may be so slight as scarcely to be noticed, or may be severe. It is frequently accompanied by spots of light or sparks before the eyes, and dizziness. In one of my cases there was actual hallucination, the patient complaining of seeing the figure of a woman. Many patients complain of a feeling of "constant burning distress" beneath the sternum.

Occasionally in severe cases there is failing vision, with retinal hemorrhage. There is usually some change in the mental or general nervous state. The patient may be irritable or dull, sometimes both. Noises frequently disturb her; little irritations which would not in the normal state annoy her at this time are much magnified. She may be morose, and upon slight cause wild attacks of temper may ensue. Mania and actual delirium sometimes follow. The skin is apt to be dry and the color muddy or slightly jaundiced. Occasionally skin eruptions appear. Marked jaundice in our experience has been a rare symptom, indeed I have only seen it twice; one of these cases recovered under treatment, the other had acute yellow atrophy of the liver and died. I have not been able to demonstrate

[1] Read before the Kensington Branch of the Philadelphia County Medical Society, Feb. 2, 1907.

any constant changes in the size of the liver as based on external examination. Occasionally the organ was slightly enlarged.

The bowels are usually constipated; frequently the patient will tell you she has a stool every day, possibly several of them, but they are small, and examination of the colon will usually demonstrate that it is far from empty. The bowel movements are often composed of small, hard, brownish lumps, sometimes a semiliquid stool, with considerable mucus. Flatulence will sometimes cause pain in the abdomen and may lead the patient to believe that labor is coming on. Rarely, very rarely, is the intestine actually emptied except by purgatives and lavage, and the natural movements are only a core of feces, the greater part remaining firmly attached to the walls of the bowel. High vaginal examination of the rectum, through the posterior vaginal wall or the rectum itself high up, will frequently demonstrate this fact.

The frequent examination of the urine is of the utmost importance; this has been recently made of still greater interest by the investigations of Williams and others of the ratios between the excretion of urea and other nitrogenous compounds, ammonia and its combinations. The total quantity in the 24 hours is not diminished. The specific gravity is lower than normal, the total excretion of solids decreased; but here we must not rely on the results of one or two examinations, but must make comparison between the solids in as large a number of specimens from the same individual as possible. In fact the urine should be examined every day if possible, and at least twice a week; the latter during a normal pregnancy, while during an attack of toxemia a daily examination should be the rule. The diet of the patient, the amount of fluids she is drinking, and many other things must be taken into account.

It is very unsafe to say that a patient is or is not excreting a normal or low amount of solids simply from one or two examinations. The urine should be carefully studied all through the attack, and then on all through her pregnancy, and for at least ten days after delivery. Albumin is frequently found in varying quantities. Specimens of albuminous urine should be sent to proper laboratories for differentiation of the albuminous deposit when the physician has not the time or facilities for making these examinations himself. Where casts are present and are persistent, and where dropsy and other nephritic symptoms complicate the case, it would show either that the kidneys were feeling the effect of the toxicity of the blood or that the patient had a nephritis preceding her pregnancy. Our experience has taught us that a patient may be distinctly toxemic for some time and yet show no albumin at all, although this is rare. One young primipara whose urine I had examined once or twice a week up to the eighth month showed no albumin at all, and yet she was suffering from toxemia all the time. I then omitted examinations for two weeks because she did not bring specimens to my office. She went into labor at 8½ months, and while in labor developed eclampsia, from which she recovered, although the child was lost. During the eclampsia she had plenty of albumin in her urine. Sugar is not usually present unless it be a trace of lactose; evidences of glycosuria would point to diabetic complications.

The amount of urea is decreased in toxemia, and here also the results of a few examinations, and without a careful study of the total solids excreted and their composition and proportions, will give little information of importance. Many facts must be taken into account in the study of the urea excretion: the diet, the amount of fluids taken, the normal urea index of the patient. Some persons excrete a larger amount of urea than others. I have now records of one series which at present sum up over 2500 examinations of the urine of pregnant patients; so far I have not been able to prove to my own satisfaction that the amount of urea excreted in pregnancy is materially less than in the non-pregnant state. I think a percentage of 1.25 would be a fair average normal for a pregnant woman. I have often seen it run less for weeks and yet the patient would be excreting well. When, however, it drops suddenly far below one per cent there is usually dan-

ger. Probably in these cases the amount of free ammonia in the urine would be found to be much increased. I have had no experience as yet in testing for these ammonia compounds as recommended by Williams, and I am glad the society has asked Dr. Foulkrod to be present to give us the benefit of his very considerable experience along this line.

The heart action is increased in toxemia. There may be an increased second sound. The pulse tension I believe is always or nearly always much increased.

I have not been able to demonstrate any marked leucocytosis above that of normal pregnancy, and I have had no experience in testing the toxicity of the blood on animals. I have not been able to demonstrate any constant or long-continued rise of temperature in patients suffering from the toxemia of pregnancy unless eclampsia develops. Occasionally I have noticed a rise to 100° or 101° F., but this did not continue for more than a day or two. The tongue is coated with a brownish coat and the breath is sometimes offensive.

It seems to me that as we review the symptoms of this condition we are struck with the similarity between them and a prolonged attack of intestinal indigestion; and yet the toxemia of pregnancy is more than that. Its symptoms differ quite markedly from uremia, and in most instances the urinary findings are quite different. We believe that the toxemia of pregnancy is a distinct pathological condition, and unrelieved by treatment is most dangerous to both mother and child. Its most common termination when not relieved by treatment is those convulsive seizures known as eclampsia. It is the cause of eclampsia. In other instances it causes pernicious nausea, and in still rarer instances acute maniacal seizures, as in a case reported by Davis of this city. What we may call a form of chronic intoxication accompanied by fever and without convulsions may be seen and is to be differentiated from septicemia. This diagnosis is often very difficult, however. Septicemia is most often seen after delivery; the microscopic and bacteriological examination of the blood and of any discharge and examination of the pelvic organs would aid in the diagnosis, especially when supplemented by a thorough and scientific examination of the urine. Personally with all these aids I have sometimes found the differential diagnosis quite difficult.

Treatment.—The treatment of the toxemia of pregnancy is based on efforts to increase elimination, first of all by the bowels. Purgation should be started and continued until the bowels are absolutely clean and a good flow of that natural intestinal antiseptic, the bile, is started. For this purpose calomel given in doses of ¼ grain every hour until 10 grains are taken, and often combined with one-fourth to one-half a drop of croton oil, and followed by the free use of salines, gives in our experience the best results. If there is vomiting, or to relieve the substernal distress so often complained of, lavage of the stomach may be practiced with good effect. The stomach may be washed out with sterile water with bicarbonate of soda 3j to the quart. If the calomel produces nausea when given by the mouth, it may be washed into the stomach through the tube. Unload the lower bowel by washing out the colon, first by the usual "triplex enema," then by lavage of normal salt solution. The lavage should be repeated three or four times a day until the solution comes out clear. After the bowels have been thoroughly emptied the enteroclysis should be discontinued. I have frequently found it a very difficult matter to thoroughly empty the intestine of a pregnant woman. Following the enteroclysis the intestinal peristalsis should be stimulated by such drugs as nux vomica, cascara, and possibly aloes, while a mild impression by calomel may be kept up for some time after the attack is over and strict attention should be given to the bowels until the end of pregnancy.

Excretion through the skin should be stimulated in mild cases of toxemia by simple warm baths, proper clothing, and exercise. In cases more severe the hot pack will be necessary. These packs must be continued until a free perspiration is produced. To quiet the high-tensioned circulation, bromides or chloral in suitable doses

may be used, or the tincture of veratrum viride in doses of 15 to 20 minims is better. When the nervous tension is high a hypodermic injection of ¼ grain of morphine does good and may be repeated once. It quiets the patient's restlessness until the eliminatives have time to work.

To increase the flow of urine and favor excretion by the kidneys, the patient should drink a reasonable quantity of water, say two quarts a day (in twenty-four hours); the liquid foods also favor diuresis. Sweet spirits of nitre, citrate of soda or lithium, acetate of potash, salicylate of soda, are all of use.

The diet should be restricted to milk and milk foods, the lighter broths, and fruit during the attack. Later the white meat of chicken may be given. All stimulants should be prohibited, as they do nothing but harm. Even tea and coffee are better done without.

Plenty of fresh air is a necessity to these patients—at first in the patient's room; and later a regulated amount of exercise should be taken daily. Massage and passive movements are of use. We have never used hypodermoclysis or bloodletting unless eclampsia develops, and then there is no doubt of their usefulness in suitable cases.

As a rule we do not believe the induction of premature labor helps in the cure of toxemia where the latter comes on late in pregnancy. Certainly at least it should not be considered unless all other means of cure fail. If labor comes on spontaneously I do nothing to prevent it, but if the patient does not develop eclampsia spontaneous premature labor in my experience has been somewhat rare. The forced induction of labor seems to me to simply add the shock of a rather severe obstetric operation, and should not be considered except as a last resort. In cases of toxemia arising early in pregnancy, especially when the disease manifests itself in pernicious nausea, it may be necessary to empty the uterus promptly.

In a large number of cases the toxemia will respond to proper treatment, so that interruption of the pregnancy will be unnecessary. In the toxemia of pregnancy as in many other diseases the value of the treatment depends a great deal on the earliness of its instigation; the earlier the treatment is started the better the prognosis.

THE TREATMENT OF ECLAMPSIA, BASED UPON 86 CASES OF ECLAMPSIA AND 278 OF ALBUMINURIA IN THE MATERNITY OF THE UNIVERSITY OF PENNSYLVANIA.

BY JOHN COOKE HIRST, M.D., PHILADELPHIA, PA.,
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Eclampsia fortunately gives warning in all but a small proportion of cases, either by the appearance of large amounts of albumin in the urine or by the constitutional symptoms of toxemia, in the cases in which the urine is as yet free from albumin, and appropriate treatment may be instituted to avert, if possible, any outbreak of convulsions. The proportion of cases in which convulsions suddenly appear without previous warning of any kind is very small indeed, although such cases do undoubtedly occasionally occur. The most valuable symptom of impending trouble is the presence of albumin in the filtered urine, and in 85 to 90 per cent of cases it is the first symptom to make its appearance. In the remainder the constitutional symptoms of toxemia antedate the appearance of albumin. The value of the quantitative determination of urea for diagnostic purposes is practically *nil*, as it varies within such wide limits that no definite conclusion can be drawn. However, it is with the treatment of the convulsive attacks that this paper is intended to deal, and not with the preventive treatment, and it will facilitate the discussion of the subject to consider categorically the different plans of treatment which have been recommended.

1. *Anesthetics.* The only anesthetic to be considered is chloroform. Ether is a marked irritant to the kidneys, and its use will only make bad matters worse. The value of chloroform is in administering it before the convulsion begins, in the hope of

averting it. During the convulsion an anesthetic is useless, as the patient has apnea, and does not inhale it. Used to avert a convulsion, however, when the premonitory signs of the convulsion appear, chloroform is often of the greatest value.

2. *Methods of reducing blood-pressure.* The blood-pressure in eclampsia is usually extremely high. Taking the normal at 110-120, it runs to an average of 180-200 in these cases. One case in our records showed a blood-pressure too high for the Stanton instrument to record—over 300. Two methods of efficiently reducing this pressure are at our command—venesection and the use of veratrum viride. Of the two, fluid extract of veratrum viride has given the best results. Administered in an initial dose of 15 minims hypodermically, and repeated every hour in a dose of five minims for several doses, the results have been most satisfactory. Venesection is more difficult to perform, and in the cases that require it most it is often extremely difficult to get the blood to flow from the vein in sufficient quantity, although it is sometimes of the greatest value. Eight to sixteen ounces is the amount of blood it is desirable to extract.

3. *Morphine* has been extensively used in the treatment of eclampsia. Veit has reported a series of 62 cases treated with large doses of morphine, with a mortality of only 3.3 per cent. The objection to the routine use of morphine is that it is well tolerated in parenchymatous nephritis, and tolerated not at all in interstitial nephritis. In view of the uncertainty as to which class of kidney lesion we have to deal with, it is wiser to restrict the use of morphine to those cases whose convulsions are not controlled by the ordinary treatment and whose condition does not improve. If used at all, doses of ½ to ¾ grain hypodermically are given. Small doses are of no use.

4. *Chloral* is extensively used in the European clinics, and has given apparently good results. It is administered in large doses, 30 to 60 grains, by enema, to a dose. Chloral and particularly morphine have a tendency to antagonize the eliminative treatment, and for that reason also it is not advisable to use them routinely.

5. *Pilocarpine* is most dangerous. In the Edinburgh Maternity the routine use of pilocarpine gave a mortality of 66 per cent, chiefly from edema of the lungs. Its use, then, should be restricted to the cases which cannot be made to sweat by hot vapor baths or hot packs, and which are obviously not improving under treatment. Under these circumstances pilocarpine is sometimes of value. It is used in a single dose of one-eighth to one-sixth of a grain.

6. *Thyroid extract.* Since the work of Nicholson, of Edinburgh, on the influence of the thyroid gland in toxemia of pregnancy, thyroid extract has been recommended in the treatment of eclampsia, the claim being based upon its value as a vasomotor dilator. It has not yet been given a sufficiently extended trial to warrant definite conclusions as to its value, but it would seem to be more valuable in the preventive treatment than when convulsions have appeared.

7. *Catharsis.* The bowel is one of the two most important routes, if not the most important route, of elimination. Free purgation is most essential, and can be secured in several ways. If the patient is conscious and can swallow, four drops of croton oil in a little sweet oil may be dropped on the back of the tongue. She may be given two-drachm doses of a concentrated solution of magnesium sulphate every fifteen minutes until her bowels begin to move freely, remembering that it may require a very large dose, several ounces, of magnesium sulphate to be effectual. The most satisfactory means of purgation, however, is to wash out the stomach with a stomach tube, and through the tube introduce two ounces of castor oil and four drops of croton oil. A somewhat larger quantity than is actually needed is used, to allow for what may cling to the sides of the tube. An ounce of magnesium sulphate in solution may be substituted for the castor and croton oil. This method has the very great advantage of thoroughly cleansing the stomach, and that one dose of the cathartic is sufficient.

8. *Diaphoresis.* The skin is second in importance only to the bowel as a means of elimination. Sweating is best induced by a hot vapor bath, or if the apparatus for this is not available, a hot wet pack. The bath or pack is continued for a period of thirty minutes every four hours, and during it the patient's head is covered by an ice-cap. The hot pack can be made more efficient by the addition of several hot bricks, each wrapped in a towel, and four ounces of alcohol poured on each brick. They are then placed under the wet blankets, in such a position that they will not burn the patient's skin. The use of pilocarpine as a diaphoretic has already been mentioned.

9. *Hypodermoclysis* is of the greatest value, and is best given a pint at a time, under the breasts, every eight hours. A larger amount than a pint is not advisable, as there is some danger of pulmonary edema, particularly if the patient does not sweat and purge promptly and freely. The use of salt solution by the bowel is not so satisfactory, as with the amount of cathartics administered the salt solution would in all probability be promptly expelled.

10. *Forcible delivery.* The advisability of prompt evacuation of the uterus in these cases is a question which is still under discussion. It is undoubtedly true that in the majority of cases the convulsions cease, or at least diminish in frequency, after the uterus is empty. Hence it is argued that it is a good plan to artificially empty the uterus as a routine procedure. The objection is that these patients stand any operative procedure very badly, and that the mortality from shock is extremely high, much higher than that we can secure by more conservative forms of treatment. The rather violent eliminative treatment will often by itself induce labor, and hasten quite markedly the dilatation of the cervix, so that it is frequently possible in such a case to terminate a labor by forceps without shock and to the patient's great benefit. In cases where this happy result is not attained, the following measures have been recommended to secure delivery: (1) Ordinary induction of labor with bougies or bags, the labor to progress while the other treatment is being carried out. (2) Forced dilatation of the cervix by the manual method or by Bossi dilator and extraction of the child with forceps or by version—a method with considerable shock and a high maternal and fetal mortality. (3) The slow dilatation of the cervix by hydrostatic dilatation—Voorhees's bag or the Pomeroy bag, designed to dilate the lower uterine segment and vagina. (4) Vaginal hysterotomy, or vaginal Cæsarian section as it has been called; cutting the anterior lip of the cervix and extraction of the child by forceps—also a procedure of high mortality in eclampsia. (5) Cæsarian section—with too high a maternal mortality to justify the operation.

As a result of practical trial of the different methods we have come to the conclusion that it is wiser to defer any interference with labor, except under one of three conditions: If the patient is already well advanced in labor, with good dilatation, the application of forceps is advisable; if the patient is seen shortly after the onset of convulsions it is often advisable to empty her uterus by one of the slower methods of dilatation and delivery, and in such a case the Pomeroy bag will probably prove of value; if the patient is getting worse under treatment and is losing ground, it is justifiable to take the risk of delivery, in the hope of an improvement when the uterus is empty. Under other circumstances the labor is better let alone.

A Routine Method of Treatment.—It should be remembered that the place for an eclamptic is in a hospital, and that the treatment of such cases in a private house presents many more difficulties, and adds considerably to the danger. A routine method of treatment which has yielded good results in practice is the following:

1. Avert the convulsion, if possible, with chloroform, and prevent injury to the tongue during convulsions by a mouth-gag of some kind.

2. Give 15 minims of veratrum viride hypodermically.

3. Wash out the stomach, and through the tube pour in 2 ounces of castor oil with 4 drops of croton oil. Or place on back of

tongue 4 drops of croton oil and 10 drops of sweet oil.

4. Hot vapor bath or hot pack for thirty minutes in every four hours.

5. Hypodermoclysis Oj salt solution under breast every eight hours.

6. If convulsions recur, repeat veratrum viride in 5-minim doses every hour, and if after three hours pulse is still bounding and patient cyanosed, perform venesection.

7. Under ordinary circumstances let labor alone.

When eclampsia occurs in the middle trimester of pregnancy or somewhat later, a patient may recover from the attack, and her pregnancy continue. Under such circumstances she should not be allowed to go beyond the eighth month of pregnancy, and should have labor induced at that time.

Résumé of Cases.—The conclusions set forth in this paper are based upon the study and analysis of 86 cases of eclampsia and 278 cases of albuminuria—a total, allowing for 11 cases of albuminuria appearing also in the eclampsia list, of 353 patients. I shall attempt only the briefest summary of the cases:

Patients, 86; ages, 14 to 41.

Primiparæ, 65; multiparæ, 21 (including one case, aged 15, with her third pregnancy).

Number of children, 88 (two sets twins).

Deaths.—From eclampsia, 23; from ether nephritis three weeks after recovery from eclampsia, 1; from gangrene of lung two weeks after recovery from eclampsia, 1.

Death-rate.—Primiparæ, 33.8 per cent; multiparæ, 14.25 per cent.

Total death-rate chargeable to eclampsia, 27.4 per cent; excluding cases brought in in ambulance in hopeless condition (13 in number), 13.2 per cent.

Children still-born 40, of which 17 were under 8 months.

Operations.—Induced labor, 16—2 deaths; vaginal hysterotomy, 2—1 death; Pomeroy bags, 1—no death; Bossi dilators, 6—4 deaths; version after manual dilatation, 9—4 deaths; forceps, 4—no deaths; craniotomy, 2—1 death.

Of the cases of albuminuria, 278 in number, the amount of albumin varied from a trace to nine-tenths of bulk on boiling. In 11 cases labor was induced to avert an attack of eclampsia, all successfully. In 11 others convulsions suddenly appeared, 2 of which ended fatally. So that in 278 patients whose filtered urine showed albumin, eclampsia developed in 3.9 per cent in spite of treatment. Of the 278 patients 40 had had eclampsia in previous pregnancies, but escaped in the present one, under treatment.

THE STUDY OF THE URINE IN THE TOXEMIA OF PREGNANCY AND IN ECLAMPSIA.

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It is but just to say as a premise to these remarks that the experience gained in examining urines of all types leads us to believe that the results of our examinations are a very poor indication of the pathological changes existing in the substance of the kidneys or liver. It is, however, the best guide that we have at our command.

Repeated comparison of urinary examinations with both post-mortem findings and future histories of cases has changed in my mind many of the classical readings of pathological urine; casts have been divided into many more classes, especially the granular and allied forms, and the readings from some are not as serious as might be expected.

Just as no one has positively proven that the kidneys are not glands having an internal secretion of far more import in the body economy than that exercised by their excreting function, so we have been unable to prove or disprove the relationship existing between serum-albumin, the nitrogenous excretion of the urine, and the substances under discussion. And still further we have not as yet demonstrated as true or untrue that the individual cells of the kidneys, as vital organisms, selective and of their own brain acting, are only secondarily responsible for the functional disturbance of their albumin-splitting and secretion-forming properties; these are due further back to some primary disturbance in the liver,

placenta, thyroid, or other gland, or perhaps, as a still more remote cause, in the cells of the intestinal mucosa.

Finally, we do not believe that the excretions of a patient of any type whatsoever should ever be taken as indicative of any condition existing in that patient unless studied side by side with the ingestion of that patient and with a full knowledge of the symptomatology present and the previous history.

The excretion of any of the great pathological constituents of the urine, sugar, albumin, and urea, is always influenced by the intake of the food principles from which the compound is formed.

Many other men precede us on this ground, but each year we hope for a more enlightened reading of the findings.

The insistence upon a routine examination of the urine of all pregnant patients is not necessary in presenting this part of the subject to you, and yet we find that we have all much to learn as to the frequency and thoroughness of such examinations.

It is not enough that you should study the urine once a month until the last month of pregnancy, then more frequently until delivery, but each case should be a law unto itself, to be classed as possibly toxemic or not. In the first class we would include the elderly primipara, the neurotic, the luxurious, the habitually constipated, those with enlarged and tender thyroids, and such as give a history of previous toxemia—these demand an examination of excretions once every two weeks unless indicated oftener by the findings, and every week during the last month.

Should an infection of any type supervene during the course of the pregnancy, rigid examinations of the urine should be at once instituted.

Toxemic symptoms in the patient or deviations from the normal in the findings of any one specimen demand the collection of the amount excreted in twenty-four hours, and then the thorough tracing of quantities present of the following constituents: sugar, albumin, and urea, together with specific gravity and centrifuging for casts.

This paper does not include technique, but we cannot pass over one or two minor points often omitted by the best of men.

Examinations for sugar should be made after albumin has been thrown down and filtered out.

Examinations for serum-albumin should be made of filtered urine only.

Examinations for urea and ammonia should be made after filtering urine.

We have found that even when allowing for a lower nitrogenous intake the average excretion of urea in the normal pregnant patient is lower than the urea excretion of such a patient is when not pregnant. We cannot explain this; it may be true that the nitrogen is stored up in the uterine muscle or may be used in the growth of the fetus—we do not know.

The relation of the amount of urea excreted in pregnant patients shows a more variable ratio to the specific gravity of the urine than is true of non-pregnant women and of men, usually being less.

One step further: it is usually true in patients manifesting symptoms of toxemia that the urea excretion is lower than has existed in that patient under previous normal conditions in the same pregnancy.

The percentage of normal pregnant patients showing serum-albumin in the urine is in our experience comparatively small.

The presence of serum-albumin in the urine of patients exhibiting symptoms of toxemia, unless a preëxisting kidney disease be present, is the unusual rather than the usual condition, early in the toxemia; while the presence of large amounts is the usual finding in eclampsia or late in the toxemia.

From these results we deduce, as other men have, that in the majority of cases, in the early diagnosis, prophylaxis, and treatment of toxemic states of the pregnant patient, the study of the nitrogen excreted in the urine is of vital importance.

In the case of toxemia progressing to eclampsia, the quantitative study of serum-

albumin and the recognition of casts, together with the estimation of nitrogenous elimination, is to be carried out.

The results of repeated studies lead to the following conclusions: When on a normal mixed diet the nitrogenous elimination continues to fall or persists at a low figure, you can infer that the patient needs to decrease the intake or increase the output of nitrogen principles. But when the diet has been restricted in nitrogen principles you must expect to find a low excretion of nitrogen, and then a very low and persistently low excretion should be carefully watched and associated with the clinical symptoms.

You will notice that we refrain from using any hard and fast numbers below which it is dangerous to go; there can be no such estimates. We have repeatedly followed patients with urea output below one per cent, total daily output about thirty-five to forty ounces, and certainly did not think them toxemic because we knew they were on a milk diet; so in all such estimations we find no definite lines of demarcation, but rather food for study, further examination. and more careful watching, should the urea continue low.

In a progressively increasing toxemic patient careful examinations are also made for kidney débris and albumin, and even should they not be present the relatively low and long-continued urea output is an indication for severe measures to promote excretion.

There is a form of toxemia described elaborately by Dr. Williams, of Johns Hopkins Hospital, which he attributes to the perversion of the nitrogen elimination, and producing the true pernicious vomiting of pregnancy. Our studies in the same field have not given the results that he has obtained, and certainly are not sufficiently well defined to base operative measures upon the findings.

The nitrogen is eliminated in the urine as urea, ammonia, purin bodies (xanthin, hypoxanthin, or nuclein bodies), and as uric acid. Considering this total nitrogen output as one hundred per cent, urea makes eighty-five to eighty-seven per cent, ammonia four to six per cent, and the other two bodies about eight per cent, the two most important being urea and ammonia.

Studies of urine of pernicious nausea cases revealed that when not neurotic the total excretion of nitrogen was normal, but that the percentage of ammonia was increased at the expense of urea, rising to ten, twenty, and even forty per cent, while the urea decreased proportionately, and that this form of toxemia differed from that spoken of above and eclampsia by different pathologic changes in the liver simulating acute yellow atrophy.

Studies made of toxemic patients other than pernicious nausea have revealed in our hands a rise in the ammonia coefficient to as high as eight or nine per cent, when one patient in the last few weeks of pregnancy, exhibited only toxemic symptoms, general and cerebral, and not nausea.

We cannot but think that the toxemia may not be of a special character, but in these instances it progresses far enough to produce changes in the liver substance which are then responsible for the ammonia excretion, and such changes are present in other toxemias than those exhibiting vomiting.

Dr. Williams had found these changes so constant that when the ammonia rose above ten per cent he was inclined to interrupt the pregnancy.

We would again call attention to the necessity for repeated examinations should any infection occur during any period of pregnancy. While attention to your toxemic patients may usually avert eclampsia, you may some day find the storm break out after an attack of influenza or similar infection.

In the presence of a severe toxemia or eclampsia the quantity of urine plays the most important part, and while it is of importance to record the presence of large amounts of albumin and a low urea estimate, it usually adds nothing to our treatment.

After the convulsions are controlled and until the patient is entirely well a thorough study of the urea excretion is again of prophylactic import.

THE EXTERNAL INFLAMMATORY DISEASES OF THE EYE.[1]

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There are several conditions characterized by or associated with redness of the conjunctiva which at first glance seem to resemble each other closely, but upon careful study they present points by which they are distinguished from each other.

Among such diseases may be mentioned conjunctivitis in its various forms, iritis, scleritis, and acute inflammatory glaucoma.

It is very important for the successful treatment of these conditions that they shall be recognized early, and it is my object to review the symptoms and objective manifestations of these conditions in order to aid in differentiating between them, and briefly review their treatment.

In the first place, conjunctivitis, broadly speaking, is an inflammation of a mucous membrane, and, in common with all mucous membranes, this inflammatory process is associated with a mucopurulent discharge. If the discharge is not mucopurulent, it is not conjunctivitis.

Taking up then the different forms of conjunctivitis, we have first *simple conjunctivitis,* sometimes spoken of as acute catarrhal or mucopurulent conjunctivitis, characterized by increased secretion, which, following a dry stage of from twenty-four to forty-eight hours, is at first watery, which overflows the lids, producing irritation of the surrounding skin. This soon becomes mucous or mucopurulent in character, appearing over the surface of the cornea and in the palpebral fissures as grayish-white films or flakes which interfere with vision, and in drying glues the edges of the lids and binds the cilia together, especially in the mornings. The *bulbar conjunctiva* is bright-red, swollen, and in severe cases presents small hemorrhages over it. The blood-vessels can be seen very much swollen and capable of being moved by slight pressure and movement of the lower eyelid with the finger. The *palpebral conjunctiva* shares in the inflammatory process and the lids become swollen. The patient complains of a burning, itching, and gritty sensation of the lids. Photophobia and blepharospasm are not marked as long as the cornea is not involved.

The causes of this condition are infection by microörganisms; rapid changes in temperature associated with faulty nutrition; dust, smoke, foreign bodies, systemic diseases, nasal diseases, and uncorrected eye-strain.

Acute contagious conjunctivitis, epidemic catarrhal conjunctivitis, or "pink-eye," is an acute, highly contagious, mucopurulent inflammation of the conjunctiva due to the Koch-Weeks bacillus. Both eyes are usually affected.

The patient first complains of a mild burning sensation of the lids, which are stuck together upon waking in the morning, and some increase in lacrimation. About the third day these symptoms become worse and the patient complains of a sensation as of a foreign body in the eye. There is some photophobia and pain upon using the eyes. The ocular conjunctiva is a bright-red color, whence the name "pink-eye." The palpebral conjunctiva is deeply injected and the retrotarsal folds are thickened. The lids themselves are swollen. The acute stage usually lasts from four to ten days, the symptoms gradually subsiding. Hemorrhages are generally present within the layers of conjunctiva, and as a result of the constancy with which these occur the disease has been called hemorrhagic conjunctivitis by English writers.

The diagnosis will rest upon the fact that several members of the family or commun-

[1]Lecture delivered at the Polyclinic Hospital and College for Graduates in Medicine, Nov. 19, 1906.

ity are affected, upon microscopic examination, and upon the appearance of hemorrhages in the conjunctiva about the third or fourth day.

A *chronic catarrhal conjunctivitis* is caused by the diplobacillus of Morax and Axenfeld, which is characterized by a chronic, not very severe blepharoconjunctivitis, without follicles or membrane, but with a typical erythema of the edges of the lids, with slight maceration of the skin, most marked at the angles, especially the internal angles. The secretion is watery but not copious. It is extremely contagious. The diagnosis rests upon the finding of the microörganisms in the secretion upon microscopic examination.

Purulent conjunctivitis is a term usually applied to infection by the gonococcus of Neisser, although purulent inflammation may result from infection by the pneumococcus of Fränkel, the streptococci, and the staphylococci.

Gonorrheal conjunctivitis is caused by infection with the gonococcus of Neisser, and is seen most frequently in infants (ophthalmia neonatorum), although it may occur in adults (gonorrheal ophthalmia).

The early recognition and treatment of this form of conjunctivitis is of the utmost importance in order that the patient's sight may be saved. From 75 to 80 per cent of the cases of blindness occurring early in life are the result of careless or delayed treatment of this form of conjunctivitis.

Ophthalmia neonatorum usually begins on the third day after birth, although it may occur as early as twelve hours after birth, with swelling and redness of the lids and a slight turbid discharge. This soon changes to a yellowish or greenish-yellow pus which is very abundant. The *ocular* conjunctiva is intensely congested, later becoming chemotic and infiltrated, forming a hard rim surrounding the cornea which forms the bottom of this depression. The *palpebral* conjunctiva is bright-red and smooth at first; later the lids become less swollen, the conjunctiva becomes soft and puckered into folds, its surface becoming rough, velvety, and dark-red in color.

Both eyes are usually affected, the one later than the other. The greatest danger in these cases is the formation of corneal ulcers which by perforation allows the infection to spread to the deeper tissues, producing virulent inflammations or panophthalmitis. Even when corneal ulcers do not perforate, the resulting scars are sometimes so dense that the eye is rendered useless.

Gonorrheal ophthalmia in adults presents much the same characteristics as that occurring in infants. The cornea is more frequently involved than in infants, and in many instances the sight of both eyes is entirely destroyed in spite of most energetic treatment.

The prognosis is somewhat more favorable in infants than in adults, and the sight can usually be saved if the patient is seen early and the proper treatment employed.

The diagnosis is based upon the time of onset, the character of the inflammation, and microscopic examination.

The diagnosis of other forms of purulent conjunctivitis due to the pneumococcus, the staphylococci, and streptococci is based upon the result of microscopic examination.

Membranous conjunctivitis is represented by two forms, the acute membranous or diphtheric and the chronic membranous or croupous.

Diphtheric conjunctivitis is due to infection by the Klebs-Loeffler bacillus and is characterized by intense, dusky-red swelling of the eyelid which closes the eye completely, the lid being raised or everted with difficulty. The folds of skin over the lid are obliterated. The palpebral conjunctiva is covered with a thick gray membrane which is closely adherent. Forcible removal of this membrane leaves a raw bleeding surface, which is soon covered again with newly formed membrane. The secretion at this time is serous and at times slightly tinged with blood.

After a period ranging from three to

seven days the lids become less rigid, the secretion becomes thick and purulent in character and very abundant. Large shreds or patches of false membrane may come away.

The disease varies greatly in severity. In some cases it is so mild that the true nature of the disease is not recognized, while in others rapid destruction of the cornea and surrounding tissues takes place.

The diagnosis is established by finding the bacillus in the secretions.

Chronic membranous conjunctivitis, formerly spoken of as croupous conjunctivitis, differs from diphtheric conjunctivitis in that there is only slight swelling of the lids and the attack is more prolonged. The false membrane is more superficial and can be removed with less difficulty, without causing more than a slight bleeding; it rapidly reforms when removed. The bulbar conjunctiva is not involved as it is in diphtheric conjunctivitis. The cornea usually escapes, except in very severe cases.

The absence of the Klebs-Loeffler bacillus, the soft swelling of the lids, and the superficial character of the membrane tend to differentiate it from diphtheric conjunctivitis.

Granular conjunctivitis or trachoma is characterized by the formation of granulations on the palpebral conjunctiva and the palpebral folds. The so-called *papillary* granulations are circumscribed aggregations of lymphoid cells and are most abundant in the tarsal conjunctiva of the upper lid. They are less numerous in the lower tarsal conjunctiva. *Follicular* granulations are most abundant in the retrotarsal folds and appear as hemispherical, semitransparent bodies of a grayish-pink or white color. They may be disseminated or arranged in parallel rows forming a dense, unyielding mass.

In general appearance the mucous membrane is at first rough and uneven, containing grayish-white, semitransparent bodies which vary in size, and from their appearance have been called "sago-grain" granulations. They develop first in the lower cul-de-sac. There may be no irritation and but slight discharge.

Later the follicles grow larger, are crowded more closely together, are elevated above the surface of the conjunctiva, and very dark-red in color, giving the lid when viewed from the outside a dark appearance. The lid is thickened and stiffened so that the normal folds in the skin of the upper lid do not form, the lid is pushed down and the palpebral fissure narrowed, giving the patient the characteristic dreamy or sleepy appearance of this stage. These changes are associated with irritation, mucopurulent or purulent secretion, photophobia, and local pain if the cornea becomes involved. The follicles finally undergo degenerative changes in which they shrink and gradually pass into the stage of cicatrization. In this stage, grayish-white scar lines appear throughout the conjunctiva. The contraction produced by these fibrous changes gives rise to various deformities of the lid and its border, such as entropion, ulceration of the cornea, and pannus. Pannus consists in the formation of vascular tissue over the cornea, usually beginning under the upper lid and extending downward, until, in severe cases, it involves the whole cornea. The blood-vessels are continuous with those of the conjunctiva. There is more or less disturbance in vision, and in severe cases blindness may result.

Vernal conjunctivitis, sometimes spoken of as spring catarrh, Fruehjahr's catarrh, is a chronic form of conjunctivitis characterized by the presence of hard, flattened, closely packed, tesselated granulations in the palpebral conjunctiva which are pink in color, although the surface seems to be covered with a grayish film or opacity. The conjunctiva at the corneoscleral junction is thickened, forming pale, translucent nodules of waxy appearance which may encroach upon the cornea but do not undergo degeneration. These nodules may be the only manifestations, and the conjunctival injection will then be localized. There is present a mucous or mucopuru-

lent secretion which tends to form shreds in the retrotarsal folds and gives the sensation of a foreign body. Considerable itching, stinging, and burning of the lids with dimness of vision may be complained of. The lids may be glued together by the secretion in the mornings. The symptoms are aggravated by heat and are most troublesome in the summer months, while they give little annoyance in winter.

The diagnosis is established by the history of the case. The fact that it recurs and is aggravated by warm weather should help make the diagnosis clear. It differs from trachoma in the flattened appearance of the granulations, the absence of infiltration and pannus. It differs from phlyctenular conjunctivitis in that the pericorneal elevations are not so transient and do not break down and form ulcers.

Phlyctenular conjunctivitis occurs most frequently in strumous and ill-nourished children. It is characterized by the formation in the bulbar conjunctiva or at the corneoscleral junction of circular elevations or phlyctenules of a reddish-gray color surrounded by a zone of marked conjunctival injection, or by a fan-shaped network of engorged vessels running up to and ending in the phlyctenule. Later, these are changed into small, circular masses of yellow necrotic tissue which eventually break down, forming small, shallow ulcers. The phlyctenules may be single or multiple; if the cornea is not involved they cause slight discomfort, such as lacrimation and a slight stinging sensation or a feeling as though a foreign body were present. If there is corneal involvement there will be photophobia and blepharospasm in addition to the above symptoms.

Phlyctenules are distinguished from the elevations occurring in the early stages of scleritis by the fact that the latter do not break down and form ulcers. Also in scleritis the surrounding injection is bluish and not so superficial. The pain is also greater.

Iritis may simulate or be associated with conjunctivitis, so that it is necessary to bear both in mind in examining a patient in whom the bulbar conjunctiva is injected.

Iritis may be idiopathic, traumatic, or the result of constitutional disease. The objective symptoms of iritis are pericorneal injection, producing a fine, purplish-pink zone surrounding the cornea due to injection of the non-perforating branches of the ciliary vessels. In severe cases the conjunctival vessels are also injected. The pupil is contracted, while the reaction to light and mydriatics is diminished or lost. The iris is changed in color; a blue iris becomes green, while a brown or dark iris appears muddy and darker than the normal. Inflammatory attachments or posterior synechiæ may form between the iris and capsule of the lens. These are demonstrated by the failure of the iris to react freely and evenly to mydriatics. If the iris is attached at one or more spots the pupil will react unevenly. If the attachments are recent the iris may be pulled loose by a mydriatic, leaving small pigmented spots on the surface of the capsule of the lens. In severe cases a false membrane may form in the pupilary area as a result of the deposition of inflammatory exudates. The cornea also appears hazy as a result of these deposits on its posterior surface, and the aqueous may be turbid because of the presence of blood, pus, and inflammatory exudates.

The subjective symptoms are intense pain of a throbbing, stabbing character, which is worse at night. Vision is blurred in direct proportion to the amount of cloudiness of the media. The eyeball is very tender, and there is usually intense photophobia and lacrimation.

Inflammations of the episcleral tissue (episcleritis) and of the sclera itself (scleritis) may occasion some difficulty in differentiation.

Episcleritis occurs as small dusky-red or violet subconjunctival swellings situated in the ciliary region, usually on the temporal side of the cornea, although they may appear in other portions of this region. They are not movable with the

conjunctiva and do not ulcerate, but disappear by resorption, often leaving a slate-colored scar behind to which the conjunctiva is adherent. The nodule feels hard and is very sensitive to the touch. The patient may or may not complain of pain.

appearance of a halo around a light, and limitation of the visual field.

The following table shows the differential points between simple conjunctivitis and the three most important diseases of the eye which may be confused with it:

	Simple conjunctivitis.	Iritis.	Glaucoma.	Scleritis, or episcleritis.
Pain	As of a foreign body.	Severe, worse at night.	Agonizing in head.	May or may not be present.
Vision	Unimpaired.	Dim.	Dim or absent.	Normal.
Photophobia	Absent.	Severe.	Absent.	Absent.
Injection	Coarse superficial.	Fine, deep pericorneal.	Present in episcleral veins.	Bluish-red, localized or diffuse.
Secretion	Mucopurulent; flaky.	Increased lacrimation.	Not marked.	Not marked.
Pupilary reaction	Normal.	Sluggish or absent.	Sluggish.	Normal.
Color of iris	Normal.	Changed.	Normal.	Normal.
Tenderness	Not marked.	Marked.	Not marked.	Marked over area involved.
Synechiæ	None.	Posterior.	None.	None.
Tension of eyeball	Normal.	Normal or increased.	High.	Normal.

The cornea and uveal tract rarely share in the inflammation.

Scleritis occurs as a more diffuse, bluish-red discoloration associated with a more diffuse swelling not composed of isolated prominences. Later the color changes to a pale violet. It differs from episcleritis in that the cornea and deeper portions of the eye are more frequently involved, giving rise to iritis, choroiditis, opacities of the vitreous, and cataract formation. Staphyloma, due to a weakening of the scleral tissues, may also occur.

Acute inflammatory glaucoma is associated with general hyperemia, and at times edema of the conjunctiva. At the same time there is enlargement and tortuosity of the episcleral veins, which are distinguished from conjunctival vessels in that they do not move with the conjunctiva.

The diagnostic points of acute glaucoma are referable to other parts of the eye, namely, the steamy and anesthetic cornea, the semidilated, immobile pupil, the shallow anterior chamber and turbid aqueous, the discolored iris, and the rise in intraocular tension.

The subjective symptoms consist in agonizing pain in the head, blindness, the

TREATMENT.

The treatment of *simple conjunctivitis* consists in freeing the edges of the lids and cilia of accumulated secretion by washing with Castile soap and warm water, then flushing the conjunctival cul-de-sacs with a saturated solution of boric acid, to which camphor water may be added in the proportion of one fluidrachm to the ounce. This solution should be used every three hours and followed by one drop of a solution of zinc sulphate, one-half to one grain to the fluidounce of distilled water, to act as an astringent. Attention should be directed to the hygienic surroundings and general nutrition of the patient and to the treatment of existing nasal disease.

In *acute contagious conjunctivitis* due to the Koch-Weeks bacillus, the patient should be warned about spreading the infection through towels, etc. All such articles used by him should be sterilized. The burning pain may be relieved by the application of cold compresses frequently applied. If the secretion is abundant, a solution of silver nitrate, 2 to 5 grains to the ounce of distilled water, may be applied to the everted lids after cleansing with a saturated solu-

tion of boric acid. Zinc sulphate solution, ½ to 1 grain to the ounce, is useful as an astringent.

That form of conjunctivitis which is due to the diplobacillus of Morax and Axenfeld yields promptly to a solution of zinc sulphate, 1 to 2 grains to the ounce, applied three or four times a day.

The prophylactic treatment of *ophthalmia neonatorum* consists in instilling one or two drops of a two-per-cent solution of silver nitrate into each eye after the first bath. All linen or other fabrics which have been soiled by the discharge should be burned or disinfected. The sound eye should be washed frequently with a mild antiseptic solution.

During the early stage of a developed case of ophthalmia neonatorum, cold compresses should be applied to the eye constantly, night and day, for the first thirty-six to forty-eight hours. This is done by placing the compresses upon a block of ice and applying them to the eye at intervals of half a minute. The purulent secretion should be removed every half-hour by flushing the eye with boric acid solution and by means of cotton wrapped upon wooden applicators.

After cleansing, the conjunctiva of the lids should be painted with a one- or two-per-cent solution of silver nitrate once or twice a day, the excess being removed by flushing with normal saline solution.

The newer silver salts, argyrol and protargol, are used as substitutes for silver nitrate with equally good results by some practitioners. They are less irritating than silver nitrate. Argyrol is less irritating and is said to be more bactericidal than protargol. It is used in from 15- to 50-per-cent solutions, once or twice a day, depending upon the severity of the disease. Protargol may be used in from 15- to 25-per-cent solutions.

If ulceration of the cornea develops, one or two drops of a solution of atropine sulphate, 4 grains to the ounce, should be instilled three times a day. In addition, the ulcer may be touched with pure tincture of iodine by means of a pointed applicator wrapped with a little cotton, after first cleansing the floor and edges of the ulcer and using one or two drops of a 4-per-cent solution of cocaine hydrochloride to decrease the pain.

The treatment of gonorrheal ophthalmia in the adult does not differ materially from that given above. The same prophylaxis is necessary, particular care being taken to protect the sound eye. This may be done by means of a shield of glass such as a watch crystal placed over this eye and its edges held to the skin by means of adhesive strips. There is more danger of blindness from corneal involvement and spread of the inflammation to other portions of the eye in adults than in children.

Croupous conjunctivitis should be treated by the use of antiseptic washes, such as boric acid in saturated solution, corrosive sublimate 1:10,000, potassium permanganate 1:2000, or liquor formaldehydi 1:10,000 to which holocaine hydrochloride has been added in the proportion of 5 grains to the ounce.

In diphtheric conjunctivitis the same antiseptic solutions may be used. Cold applications are of value early in the attack. All articles which have been soiled by the discharge should be disinfected or destroyed. The sound eye may be protected by a shield. Antitoxin should be used to combat the infection.

Trachoma or *granular conjunctivitis* in the early stage should be treated by the application of cold to reduce the inflammatory reaction; a solution of boric acid may be used to cleanse the eye, and one drop of a solution of atropine sulphate, 4 grains to the ounce, should be used three times a day if the iris is involved.

In the second stage astringents are applicable. Copper sulphate crystal or glycerite of tannin 60 grains to the ounce may be applied to the everted lid daily. Silver nitrate solution, two-per-cent, may be used once daily if there is a purulent or mucopurulent discharge.

The pannus which follows trachoma is sometimes relieved after the use of jequirity, one per cent, for several days.

The treatment of *vernal conjunctivitis* is mostly palliative. A solution of boric acid may be used to cleanse the eye, and yellow oxide of mercury ointment, one or two per cent, may be applied once or twice a day. Zinc sulphate, 1 grain to the ounce, or glycerite of boroglycerin, 50 per cent, is sometimes used as an astringent. The disease disappears in winter, but recurs upon the advent of warm weather.

Phlyctenular conjunctivitis in children should be combated by the use of hot compresses applied to the eye for five or ten minutes every three hours, boric acid solution for cleansing purposes, and yellow oxide of mercury ointment, one or two per cent, applied inside the lid once or twice daily after the phlyctenule has broken down. This should be followed by massage of the eyeball for a few minutes. Calomel is sometimes dusted into the eye daily with beneficial results, although this should not be done if the patient is taking iodides internally, as iodine is eliminated in the tears and forms mercuric iodide, which burns the conjunctiva.

The beginning treatment of *iritis* consists in the administration of a brisk purge, such as calomel followed by a saline, and in the instillation of one drop of a solution of atropine sulphate, 4 grains to the ounce, into the conjunctival cul-de-sac three or four times a day until all congestion has disappeared. This use of a mydriatic tends to decrease pain, lessen congestion, and prevent adhesions of the iris to the capsule of the lens. Leeches may be applied to the temple to relieve congestion.

Hot compresses, as hot as can be borne, tend to relieve the pain.

Dionin has been used with gratifying results, especially in promoting the absorption of inflammatory exudates: one drop of a 5- or a 10-per-cent solution may be dropped into the eye once daily for three days, then stopped for three days, when it may be repeated as before. This drug causes a great outpouring of serum beneath the conjunctiva within a few minutes after its instillation. This entirely disappears by the following day. The eye is usually less painful after the use of this drug, and the inflammatory products are promptly absorbed as a result of the increase in lymphatic activity produced by it.

The history of syphilis or rheumatism calls for remedies to combat these underlying causes.

Scleritis and *episcleritis* should be treated by the use of atropine if iritis is present, otherwise the use of one drop of eserine sulphate solution, ½ grain to the ounce, is beneficial. Yellow oxide of mercury ointment, 1 grain to the ounce, may be used in the eye, accompanied with massage over the lid in chronic cases. Salicylates and potassium iodide may be used internally if there are any underlying rheumatic tendencies.

In acute inflammatory glaucoma a myotic is indicated: one drop of a solution of eserine sulphate, ½ to 1 grain to the ounce, should be instilled every hour or two.

A mydriatic must never be used.

Later, iridectomy should be performed if relief is not obtained.

THE RELATION OF THE VOLUME OF AIR INSPIRED TO THE RISE OF TEMPERATURE IN NEUROGENIC FEVER.

BY ISAAC OTT, A.M., M.D.,
Professor of Physiology, Medico-Chirurgical College of Philadelphia,
AND
JOHN C. SCOTT, M.D.,
Assistant Demonstrator of Physiology.

Whilst on a visit to Prague, Professor Gad suggested to one of us (Ott) a study of the volume of air inspired in relation to the fever produced by puncture of the thermogenic centers. We thought it best to first take up the rise of temperature caused by tetra-hydro-beta-naphthylamin chloride and its relation to the volume of air inspired. Some years ago Ott published a paper on the seat of the rise of temperature produced by this naphthylamin compound, and localized the seat of it in the corpus striatum and tuber cinereum. We have repeated these experiments and obtained the same results as previously published.

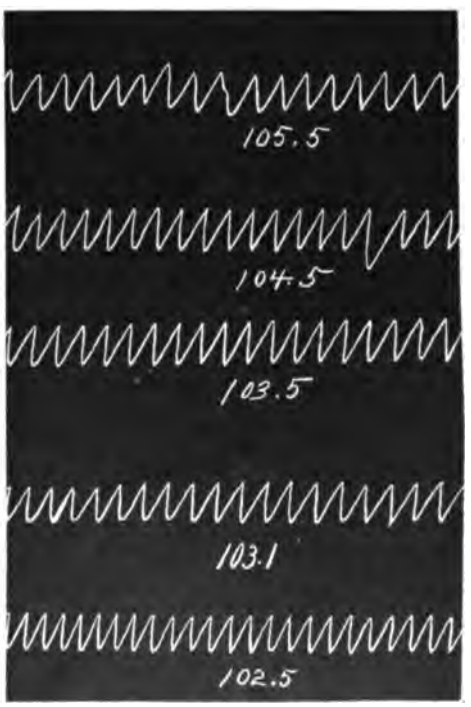


FIG. 1.—Experiment 15. 102.5° F. is normal curve. All subsequent curves are after the administration of tetra-hydro-beta-naphthylamin.

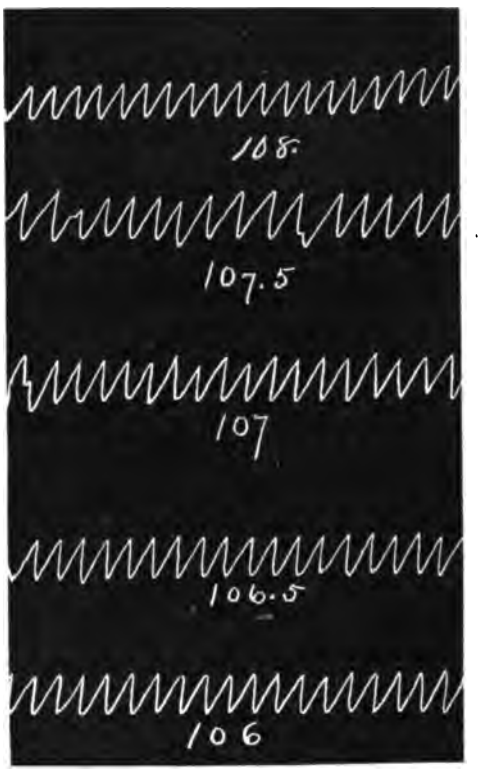


FIG. 2.—Continuation of Experiment 15. Figs. 1 and 2 show the diminished quantity of air inspired after the naphthylamin.

These experiments show that the naphthylamin is powerless to elevate the temperature after cutting out the corpus striatum and tuber cinereum. It also shows that thermogenic centers do not exist in the pons or medulla or cord. As the drug is a great stimulant to heat-producing centers, to assume a thermogenic center in these parts which has a different stimulant is begging the question. In the naphthylamin experiments the temperature continues rising although the rate of respiration, the heart-beat, and arterial tension are decreasing, showing how little thermo-

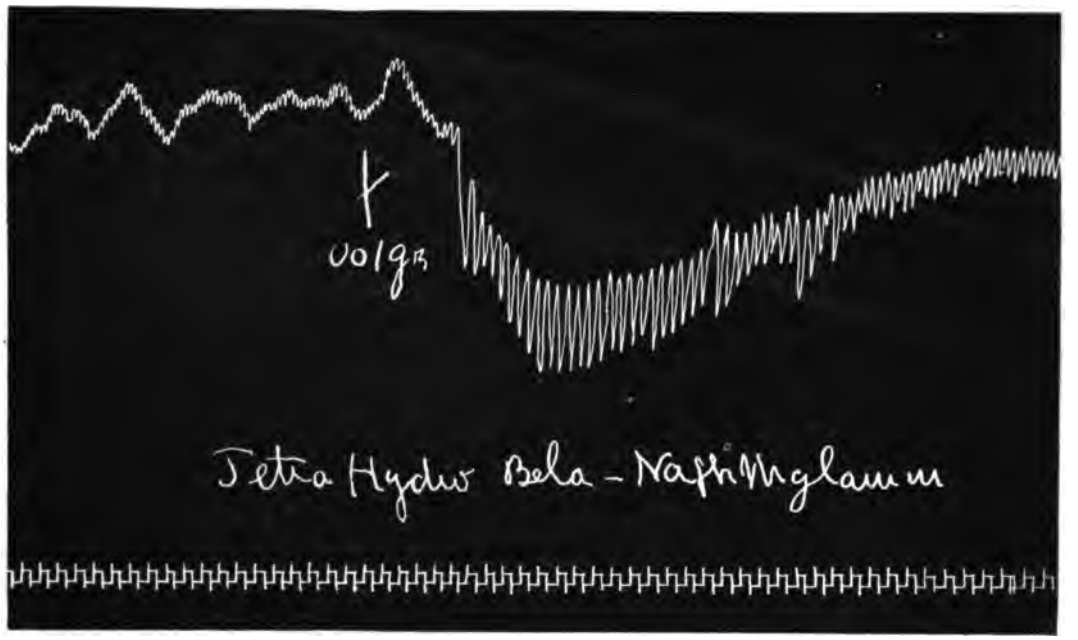


FIG. 3.—Effect of tetra-hydro-beta-naphthylamin on the pulsation of heart and the arterial tension. The line marking seconds is also the abscissa line.

genesis is dependent upon the full activity of these organs.

We then took up the study of the volume of respired air to the rise of temperature produced by the drug. To measure the volume of air we used Gad's aeroplethysmograph as made by Krusich, of Prague. The chamber intercalated between the trachea of the rabbit and the plethysmograph had a capacity of about 1900 cubic centimeters. After each observation of about a minute the chamber was removed and attached to the artificial respiration apparatus and the carbon dioxide accumulated there driven out. The aeroplethysmograph was graduated, and it was found that a movement of the writing point for 5 millimetres indicated 20 cubic centimeters of air. Gad's three-way cannula was inserted into the trachea of the large etherized rabbit. Chloretone was used as a narcotic in one experiment, but the lowering of temperature by it prevented in great part the rise produced by the naphthylamin. Hence ether was used in all the experiments. Twenty-seven experiments on rabbits were performed. In all of the experiments performed we found that the rise of temperature was always accompanied by a diminution in the rate of respiration and of the volume of air inspired (Figs. 1 and 2). The naphthylamin compound has a slowing effect on respiration and heart-beat and a depressing action upon arterial tension (Fig. 3). Now the question arises, Has the volume of air inspired any necessary relation to the rise of temperature? In the experiment with naphthylamin the decrease of

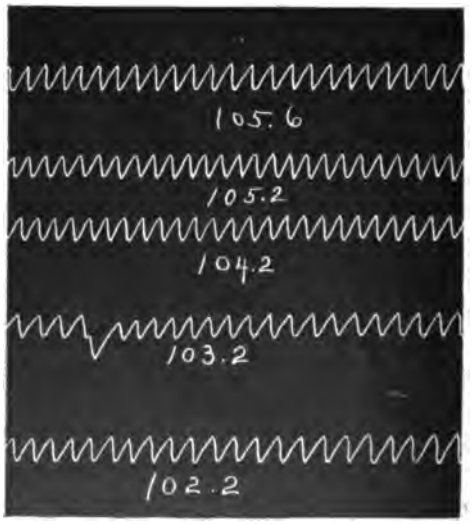


FIG. 4.—Showing the increased amount of air inspired as the temperature rises. Puncture in the tuber cinereum The line 103.2° F. is the normal curve.

oxygen inspired could not be invoked to account for the rise of temperature. The lowering of blood-pressure means a dilatation of the capillaries or at least not a constriction, and hence an increase of dissipation of heat.

Hence we are led to the conclusion (1) that the naphthylamin compound in its action proves the existence of thermogenic centers in the corpus striatum and the tuber cinereum; (2) that the volume of air inspired diminishes as the temperature rises.

Puncture of the Thermogenic Centers.—Here we used ether, and the rabbits were fastened on their backs during the experiment. This accounts for the want of excessive rise of temperature. The temperature of the room averaged about 75° F. In all the experiments, whether on corpus striatum or tuber cinereum, with the rise of temperature there was an increased rate of respiration and a greater volume of air taken in. This is shown in Fig. 4. Now, does the rise of temperature depend upon the increased volume of oxygen inspired? There is no doubt that a puncture of the thermogenic center is accompanied by an increase of heat production, as has been shown by Ott. Sachs and Aronsohn have also shown that the nitrogen excretion is increased. The need of the muscles for oxygen regulates the amount taken in and not the excess of oxygen present. In the experiments with naphthylamin the supply of oxygen was diminished, yet the temperature rose to 108° F. Although the ordinary supply of oxygen is exceeded in the rise of temperature by puncture of the brain, we incline to the belief that there is no necessary relation between the rise of temperature and the volume of oxygen inspired.

IS THE USE OF IODIDE OF POTASSIUM ADMISSIBLE IN PULMONARY TUBERCULOSIS?

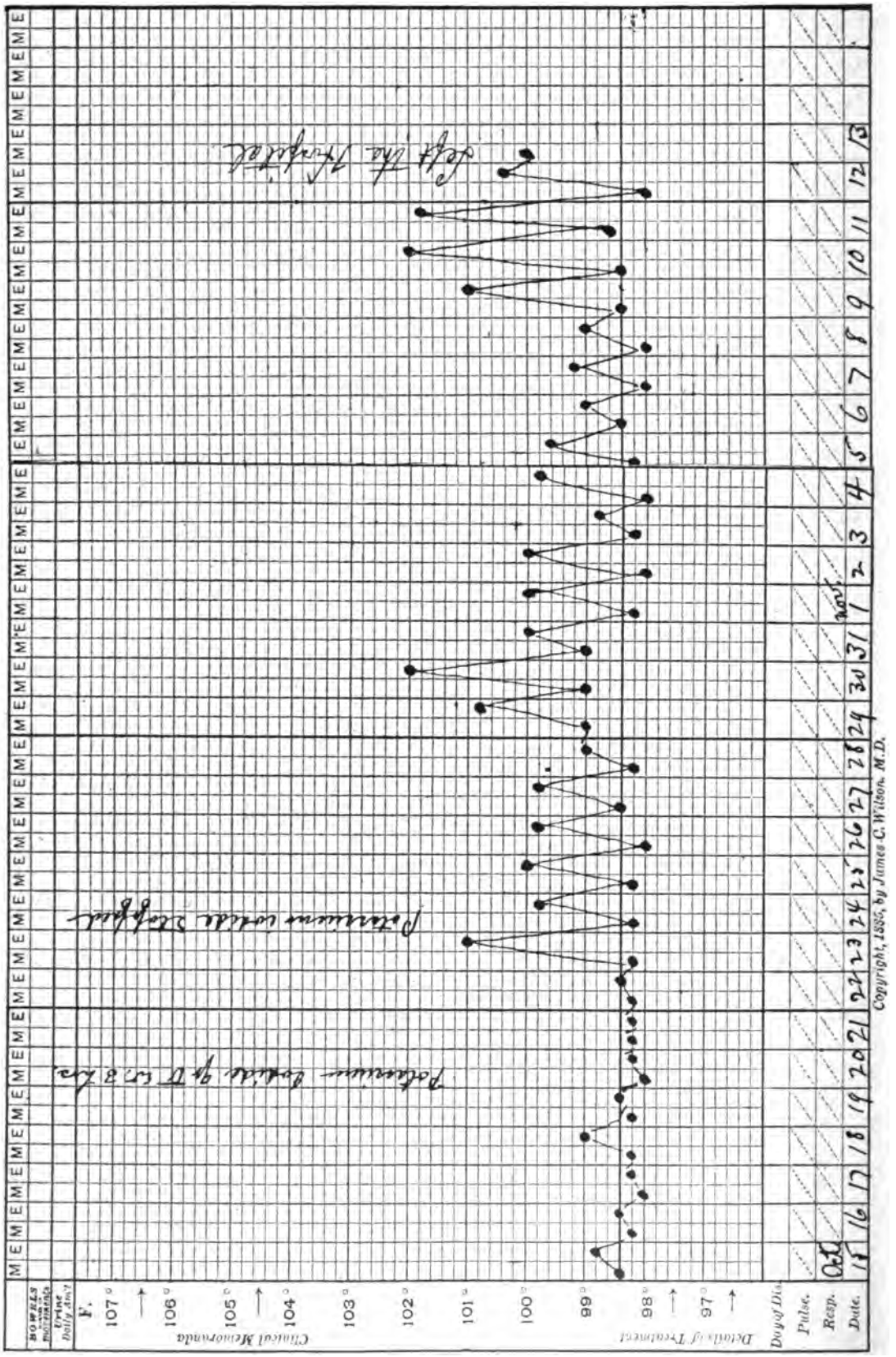
BY H. R. M. LANDIS, M.D.,

Physician to the Tuberculosis Wards of the Philadelphia Hospital, to the Phipps Institute, and to the White House Sanatorium; Demonstrator of Medicine in the Jefferson Medical College.

The advisability of using iodide of potassium for diagnostic purposes in cases of suspected pulmonary tuberculosis is believed by some to be a justifiable procedure. There are many, however, who look upon this use of the drug as unwarranted and not altogether free from danger.

About two years ago I undertook some experiments at the Phipps Institute to determine, if possible, whether iodide of potassium had any ill effects when administered to rabbits previously inoculated with an attenuated culture of the tubercle bacillus. The amount of iodide of potassium given to the rabbits was based on a daily dosage of thirty grains to a man weighing 150 pounds. Later the amount was greatly increased, as much as five grains daily being given to the rabbits. These experiments failed to demonstrate that the iodide of potassium had any deleterious influence on the tuberculous process, as no perceptible difference could be detected between the experimental animals and the controls. My interest in the question was renewed, however, by a recent clinical observation which would seem to indicate that the use of iodide of potassium for diagnostic purposes is open to some criticism. The history of the case is briefly as follows:

A woman aged thirty-six was admitted to the hospital complaining of epigastric pain. The family and past medical history were negative. Until eighteen months prior to her admission she had always enjoyed good health. At this time she first complained of vague abdominal pain, which, however, would disappear from time to time. She had never had any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cough nor blood-spitting. One year ago she had had "malaria," and since the beginning of her illness had lost 25 pounds in weight. The patient was a fairly well-nourished woman with a slight degree of secondary anemia. The abdomen was flabby and soft, with diastasis of the recti muscles. The presence of a well-marked gastroptosis accounted for the abdominal pain and other gastric symptoms. In the routine examination some indefinite signs were detected at the right apex. To determine the cause of these signs she was given five grains of iodide of potassium every three hours. It will be noted in the accompanying chart that the temperature was normal prior to the use of the iodide of potassium. On the third day after its administration the temperature rose abruptly, a cough developed, and sputum containing tubercle bacilli was obtained. Coincidentally with this, numerous fine, crackling râles appeared over the upper part of the right lobe. Previously the râles had been very few. This condition persisted until she left the hospital three weeks later.

The tuberculous process in this case was undoubtedly quiescent, and so far as can be judged from the history of the case was causing no disturbance, as the gastric condition would readily account for her ill health.

The diagnostic use of iodide of potassium was advocated by Sticker in cases presenting doubtful apical signs and without expectoration. To such cases he advised the administration of small doses of the drug for several days, when not infrequently the signs of a local catarrh would appear over the suspected area, and the cough, previously dry, would become productive of expectoration which invariably contained tubercle bacilli. The advisability of using potassium iodide under these circumstances seems to me to be open to some criticism, even though it has the sanction of so eminent an authority as Turban, who states that it forms an available diagnostic agent if the patient refuses to submit to the tuberculin test. Turban looks upon the reaction as specific only when tubercle bacilli are found, as in cases of undoubted tuberculosis he frequently failed to find the bacilli. Even admitting the harmlessness of potassium iodide under these circumstances the necessity of resorting to this test should be extremely infrequent. Trudeau in alluding to the tuberculin test states that in his opinion it should only be used when repeated and careful examinations still leave one in doubt. If this is true of tuberculin, the safety of which is now well established, how much truer must it be of iodide of potassium, the action of which in tuberculous cases is but little understood. Greater familiarity with the signs and symptoms of incipient tuberculosis will render a resort to such diagnostic agents less and less frequent.

While the presence of tubercle bacilli in the sputum is now looked upon as indubitable proof that a pulmonary tuberculosis exists, it must be clearly borne in mind that many cases in the early stages of the disease fail to show bacilli in the sputum. To wait for this assurance means the loss of valuable time when patients can most readily be restored to health. The fear of subjecting patients to the time and expense of a climatic cure doubtless accounts for the timidity in making a positive diagnosis in cases presenting slight signs. To state that indefinite signs at an apex are probably due to a tuberculous process does not, however, mean that the individual must, of necessity, go to the expense of seeking climatic treatment. It has been amply demonstrated that these cases can often be successfully treated, even in their home surroundings, if instructed as to the proper mode of living. For this reason I think we should be wary of subjecting patients to a test which, while it confirms our suspicions, certainly causes an activity of the disease which may be difficult to control.

Inasmuch as it is apparent that an incipient or quiescent lesion may be aroused

into activity by the use of potassium iodide, it would seem that its use in the more advanced stages of tuberculosis might be productive of harm rather than good. As iodide of potassium fulfils no distinct indication in the treatment of tuberculosis and there is reasonable evidence as to its dangers, the safer course would be to avoid it altogether. When, however, tuberculosis and syphilis coexist iodide of potassium is often necessary, and under these circumstances may be given.

Occasionally, too, one encounters a case in which the pulmonary lesion is suggestive of syphilis. If repeated sputum examinations fail to show the tubercle bacillus, iodide of potassium may be used as a therapeutic test. Several cases have been recently reported in which the probability of lung syphilis seemed to be established because of the fact that the lesion disappeared under the use of the iodide, the assumption being that the lesion would have remained unchanged or have been made worse had it been due to tuberculosis.

THE LOCAL USE OF MAGNESIUM SULPHATE SOLUTION IN INFLAMMATION.[1]

BY HENRY TUCKER, M.D.,
Genito-Urinary Surgeon, Philadelphia General Hospital.

Knowing that magnesium sulphate in solution when used hypodermically has distinct anesthetic properties, I first tried it as a local application with the object of getting a treatment which would relieve local pain, as all other external applications tried had been found almost valueless.

After experimenting for several years with many recognized local remedies, I had about reached the conclusion that rest in bed accomplished as much as any local application, but the remarkable results in the relief of pain obtained by the use of this substance and the abatement of inflammation have led me to report my experience.

This treatment, at my suggestion, has been used by a veterinarian with decided success in the leg injuries of thoroughbred horses.

The majority of the following cases were treated in my wards at the Philadelphia General Hospital. The case of tuberculous peritonitis was seen at the Phipps Institute. The others were met in my private practice.

CASE I.—G. M. Double orchitis following mumps. Both testicles slightly swollen and painful. Solution gave immediate relief to pain. Testicles of normal size at the end of third day.

CASE II.—L. F. Gonorrheal epididymitis. Solution gave almost immediate relief. Was not confined to bed.

CASE III.—L. F. Gonorrheal epididymo-orchitis. Marked pain, but slight swelling; pain disappeared in three hours; testicle normal in size in five days.

CASE IV.—S. R. Gonorrhea. Both testicles involved; great pain; pain relieved in five hours; swelling disappeared in three days.

CASE V.—J. A. Right gonorrheal epididymo-orchitis. Relief from pain in a few hours, and from swelling in thirty-six hours.

CASE VI.—E. G. Gonorrheal epididymitis of the left testicle. Pain relieved in ten hours; testicle normal in size in five days.

CASE VII.—J. M. Gonorrheal involvement of the left testicle. Pain relieved in five hours. Out of bed without permission. Relapse. Relief in three hours. Well in two days.

CASE VIII.—O. R. Gonorrheal epididymo-orchitis. Pain relieved in three hours, swelling in two days.

[1]Read before the North Branch Philadelphia County Medical Society, March 19, 1907.

CASE IX.—T. C. Epididymitis after the passage of a bougie. Pain disappeared in six hours; testicle normal in six days.

CASE X.—H. J. Gonorrheal epididymitis of the left testicle; extremely painful. Complete relief in twenty-four hours. Discharged in five days.

CASE XI.—N. H. Epididymitis from instrumentation; very painful. No pain in three hours; normal in four days.

CASE XII.—A. P. Chancroidal bubo of right groin; so painful patient was unable to walk. Solution with moderate pressure. Relief from pain in four hours; patient discharged, cured, in five days.

CASE XIII.—A. S. No history obtainable. Pain and tenderness in both knees. L. and L. for two days; no relief. Magnesium sulphate solution applied, with complete disappearance of both pain and tenderness in forty-eight hours.

CASE XIV.—A. T. Gonorrheal epididymo-orchitis. Pain relieved in twelve hours; discharged, cured, in six days.

CASE XV.—C. H. Secondary syphilis. Pain and stiffness in both knees. The solution applied. Completely relieved in thirty-six hours.

CASE XVI.—J. B. R. Gonorrheal rheumatism. Feet, ankles, knees, one hand, and shoulder involved. Eight weeks' duration. Solution applied to all affected parts; gave relief in four hours. Had no pain in three days. Kept in bed ten days, when he was allowed to get up. Discharged, cured, in three weeks.

CASE XVII.—J. C. Pain, swelling, and tenderness in both knees, ankles, and right wrist. Relieved from pain within five days, but swelling and tenderness persisted. Placed on aspirin without effect. Then given sodium salicylate gr. xx four times a day, with slight abatement of swelling. The right middle metacarpophalangeal articulation then became inflamed and painful. The solution gave relief in five hours.

CASE XVIII.—P. S. Double gonorrheal epididymitis; more marked on the right side. Pain relieved in two hours. Discharged, cured, within one week.

CASE XIX.—J. T. Acute articular rheumatism; ankles, knees, wrists, and shoulders involved. Relief from pain in three hours. At first could not move joints. In twenty-four hours could move slightly without pain; in three days could move all joints without pain. No internal treatment given.

CASE XX.—J. G. Syphilitic testicle. Testicle about the size of a baseball, slightly tender and painful. Relieved in a few hours. Became reduced in size under specific treatment.

CASE XXI.—Gonorrheal epididymitis; very painful. Relief from pain in two hours; normal size in five days.

CASE XXII.—S. E. Referred from medical department, Philadelphia Hospital. Had been treated for rheumatism without relief. Placed in bed. Warm magnesium sulphate solution applied to affected parts. Salicylate pushed. K. I., gr. v, t. i. d. In bed two days. No pain. Allowed the freedom of the ward.

CASE XXIII.—F. B. Gonorrheal epididymitis. Pain only on pressure. Solution applied. Patient allowed to be up. No relief. Placed in bed. No pain in three hours. Discharged, cured, in five days.

CASE XXIV.—J. C. Gonorrheal epididymo-orchitis. Pain, swelling, and tenderness relieved in forty-eight hours.

CASE XXV.—H. B. Epididymitis following instrumentation for stricture. Pain relieved in three hours. Testicle normal in two days.

CASE XXVI.—E. J. Phipps Institute. Tuberculous peritonitis. Slight pain in abdomen. Hot water gave some relief. The day following severe pain. Magnesium sulphate solution gave complete relief in seven hours. No recurrence for six days, when severe pain developed. Died two days later. Post-mortem showed intestinal tuberculosis with perforation; acute peritonitis.

I have also used this treatment in three cases of gonorrheal rheumatism with good local results.

In two cases of facial erysipelas, one responded in forty-eight hours; the other in three days. In both the local pain was abated in a few hours.

One case of alcoholic neuritis of the lower extremities obtained relief in a few hours, but the solution had no curative effect.

Two cases of traumatic neuritis were likewise benefited. A case of acute inflammatory rheumatism involving the elbow-joints obtained relief from pain in less than twenty-four hours, with disappearance of swelling and redness in eight days. I have also tried it in two cases of sprained ankle with prompt results.

It has been used on simple contusions with marked benefit.

TECHNIQUE.

The application consists of a saturated solution of magnesium sulphate in water.

This solution is applied on from 15 to 20 thicknesses of ordinary gauze. This is saturated with the solution at least every half-hour, or as often as necessary to prevent drying, depending on the time of the year and the temperature of the room. The gauze is not removed until the end of twenty-four hours; the parts are then washed with water and the dressing reapplied if indicated. There is then found to be a marked blanching of the surface, which is, however, not followed by any deleterious effects.

The attendants who made the application complain that it causes a partial loss of sensation accompanied by tingling of the hands and arms, which persists for from twelve to twenty-four hours.

In the treatment of inflamed testicle, elevation was not used, other than to prevent wetting of the bedclothes.

Some cases, as noted in the preceding report, were kept in bed, while others were allowed the freedom of the ward.

In many cases no internal medication was given.

ANESTHESIA AND METHODS PRODUCING IT.

BY HENRY B. INGLE, M.D.,
Anesthetist, Gynecean Hospital, Philadelphia, Pa.

Anesthesia is a subject the importance of which has not been sufficiently appreciated by the medical profession of this country, and is only now beginning to receive the degree of consideration which it deserves. In the great majority of American hospitals the administration of the anesthetic is the duty of the youngest member of the house staff, and falls to him with the laboratory work and the taking of histories; and when he becomes a senior resident he is allowed to do the less responsible work of holding retractors or sponging after the surgeon's knife. In England, on the contrary, anesthesia is becoming a special branch of medicine, and each hospital has its staff anesthetist as it has its staff surgeon.

Any surgeon who has suffered the mental anxiety of performing an operation under the irregular narcosis of an inexperienced anesthetist, with the alternate fears of the expulsion of the intestines from the abdominal wound or the death of his patient, will appreciate how greatly the welfare of both the patient and himself is enhanced by the assistance of one who can relieve him entirely of that responsibility. Of course the direct responsibility is the surgeon's, and the anesthetist should be accountable to him; but the impatience of the surgeon should not be allowed to hurry the anesthesia, or push it beyond the limits of safety as judged by the anesthetist.

Any general narcotic must be considered as a toxic substance, which is used in surgical anesthesia to the point of partial intoxication, and only the one who is best

informed of the depth of the intoxication should govern its degree. The anesthetist and surgeon should work in harmony however, and the nature of the operation should dictate, other things being equal, the depth of the narcosis. For example, the degree of narcosis required for a plastic operation on the cervix and perineum should not be the same as that required for an abdominal hysterectomy, and yet if, in the plastic operation, divulsion of the sphincter is practiced, the narcosis should be more complete; and such relaxation should not be accomplished by suddenly crowding the anesthetic, but should be gradually induced by the anesthetist, who is conversant with the stages of the operation and knows when the deeper narcosis will be required.

The choice of the narcotic used should depend principally upon the condition of the patient, and to properly judge of this the anesthetist should precede every narcosis by a thorough examination of the patient and her history, including in his examination all laboratory aids available. In this examination the lungs, heart, and kidneys should receive special attention, for on them the toxic influence of the drug is most apparent. In this climate ether is the narcotic of choice, but I think that I detect a growing tendency among surgeons and anesthetists to use more chloroform; and the recent suggestion of Dr. Gwathmey, of New York, that the chloroform be heated to the temperature of the blood, may enable us to achieve the good results with that drug which our Southern colleagues claim.

Ethyl chloride, ethyl bromide, and nitrous oxide are all good for short anesthesias, or may be used preliminary to ether or chloroform.

The method of administration in its technical details is largely a matter of personal habit and preference. Abroad the use of more or less complicated apparatus for administering graduated mixtures of different narcotics with oxygen is almost universal, but I am informed that each anesthetist uses a different apparatus, usually of his own invention, so no one device is universally approved. To my mind the use of a closed face mask into which the patient exhales is a detriment even when oxygen is constantly administered; and if valves are used to obviate this disadvantage, it renders the apparatus too complicated for ordinary use, and too apt to be out of order when most needed. An anesthetist usually finds enough to occupy his attention in attending his patient without the added duties of watching three or four dials, valves, and stop-cocks; and if he is called to a private residence to anesthetize it would seem unwise to carry such a cumbrous machine with him. Then, too, the psychological effect of this formidable apparatus on a person already apprehensive of the ordeal she is about to undergo is far from advantageous. Alice Magaw reports 14,000 cases of general narcosis, and after this unparalleled experience recommends the ether drop method on the open mask, and this certainly is good evidence that the simpler method is "as good as the best and better."

She advocates close attention to the little details of the art, for art it is, and attaches especial importance to the effect of the psychological condition of the patient on the narcosis. In this I wish to most heartily agree, and will even go so far as to say that I consider it one of the most important factors in anesthesia.

The preliminary attentions to the patient are most important. The restriction of diet and purgation are too well known to need more than mention here. The anesthetist should, if possible, have previously examined the patient and secured her confidence; if this is impossible, his mien as he enters the room should be one of easy confidence and calculated to relieve her dread of the ordeal before her. It is wise to quiet the patient's fears before attempting narcosis. The preliminary administration of some sedative drug is an admirable expedient in the average case. Morph. sulph. gr. 1/6 and atropine sulph. gr. 1/150 are used with advantage by some, but are certainly productive of harm where lung complications are present or threaten. At the General

Memorial Hospital in New York scopolamine gr. 1/100 and morph. sulph. gr. 1/6 are given one-half hour before operation. The best drug in my opinion is chloretone, in doses of five grains every fifteen minutes for three doses, or in one dose of ten grains one hour before operation. With such preliminary medication the patient is less nervous, more easily anesthetized, the amount of narcotic used is less, and what is of great importance, the patient "dozes" quietly after recovery from the anesthetic, and postnarcotic nausea and vomiting are greatly decreased.

In all text-books the invariable rule is given to remove all artificial teeth from the patient's mouth before anesthesia, but often in old people wearing complete upper and lower plates the removal of teeth causes the cheeks to fall in in such a way as to interfere with respiration, and I have seen cases in which the alveolar processes were so absorbed that when the lower jaw was held up and forward, after the removal of the plates, the lips completely occluded the nasal orifices and effectually shut off the breath. Of course if the plate is small enough to be swallowed or interfere with respiration by becoming dislodged it should be removed, but in all cases common sense and not text-book rules should be our guide.

Having taken all preparatory precautions, the patient should be warned against the irritation of the throat so apt to occur with ether and assured of its harmlessness; the cone should then be lightly applied without any ether and the patient allowed to breathe through it until accustomed to its presence, during which time she should be instructed to breathe quietly through the nose and to keep her mind on something foreign to her operation "so that her dreams may be pleasant." The ether should then be dropped slowly on the top of the cone, or mask, and the frequency of the drops increased as she becomes more tolerant, but the ether should never be poured. In this manner complete anesthesia can be induced in from five to fifteen minutes and with from one to two and one-half ounces of ether, and with an entire absence of any choking, coughing, struggling, or any other unpleasant phenomena. If chloretone or morphine has been given, both the amount of narcotic and time required are greatly reduced.

With very nervous women, or when speed is imperative, ethyl chloride may be sprayed directly into the cone, and the ether dropped as before, thus reducing the time for inducing anesthesia to about five minutes. The patient should be placed on the operating table before the deeper reflexes are lost, and the anesthesia completed while the final cleansing of the operative site is being performed.

During the operation the anesthetist should endeavor to keep the patient at the highest level of narcosis which the operation will allow, and to maintain that level with the fewest variations possible and the least amount of narcotic.

Should the patient be alcoholic or maintain a high arterial tension with secretion of mucus and apparent intolerance of ether, the addition of a few drops of chloroform may reëstablish more favorable conditions, when the ether may be resumed. The excessive secretion of mucus which is so frequently encountered with alcoholics and negroes is a disagreeable complication and one which may seriously interfere with an even narcosis. I learned from my predecessor at the Gynecean Hospital a method of obviating this nuisance which I have seen used in no other institution and which may be new to some. This consists in pumping out the excessive secretion by utilizing the expiratory impulse of the patient to blow it through the nose or mouth. The lower jaw is grasped with both hands with the thumbs in front and the fingers around the angle of the jaw on either side. As the patient inspires the jaw is held up and forward, thus closing the mouth, but with expiration the lower jaw is gently but firmly forced downward and backward, thus partially closing the fauces and forcing the mucus through the pharynx and

nares in advance of the expiratory wave. In this manner, with the patient's head turned to one side, I have repeatedly seen a continuous stream of mucus coursing over the patient's cheek to a receptacle below, or removed by a towel as it emerged from the nares.

That a narcotized patient should be allowed to swallow her tongue is a reflection on the skill or vigilance of the anesthetist, for that accident is impossible if he constantly attends to his duty; and yet I have seen teeth pulled to admit the mouth-gag and the tongue held forward by a string passed through its body by anesthetists in large hospitals. I have anesthetized over 700 cases in the past two years, and have never used either the mouth-gag or tongue forceps.

Of the accidents of anesthesia and their treatment, I have nothing to suggest, except that the administration of anesthetics by trained anesthetists is sure to decrease their frequency.

The condition of the air in the operating-room is very important, and we should be as careful to insure its purity as its warmth. The humidity is a potent factor for good or ill, and is generally recognized as such. I was informed by two Southern surgeons that they postponed an operation of choice in their hospital if the weather was inclement, because of the increased danger from chloroform when the humidity was high. Certain it is that all general anesthetics inhaled as vapors are less well borne in humid weather.

In regard to postnarcotic vomiting and nausea, it is proportional in many cases to the amount of ether-saturated saliva which is swallowed, and in these cases lavage of the stomach gives marked relief. In ordinary cases, however, when ether is given as above suggested, the nausea is reduced to a minimum, and especially is this the case when chloretone has been previously administered.

Bronchitis and pneumonia, if caused at all by the narcosis, are due generally to either a chilling of the entire body surface by exposure or the administration of cold ether in such proportions that by its evaporation and consequent decrease in temperature it chills the lungs directly. The prevention is obviously secured by ample protection of the patient from draughts, and the drop method administration of warm ether by a skilled anesthetist.

RÉSUMÉ.

1. Narcosis is too serious a condition to be induced by any but those skilled in the art.

2. The anesthetist and surgeon should work in harmony.

3. The simple drop method on the open cone is the preferable form of administering ether.

4. The psychological state of the patient powerfully affects the narcosis.

5. It is not always necessary to remove false teeth.

6. New method of "pumping out" excessive secretion of mucus.

7. Mouth-gag and tongue forceps are rarely necessary.

8. The accidents and sequelæ of narcosis are best prevented by the drop method administration of warm ether by trained anesthetists.

THE PRINCIPLES OF TREATMENT OF RENAL INSUFFICIENCY.

In the *American Journal of the Medical Sciences* for December, 1906, PREBLE in an article on this topic reminds us that as toxic bodies are introduced with our food or medicine and others are produced within the gastrointestinal canal, the regulation of diet, therefore, is of major importance. Foods containing undue amounts of toxins, such as the various parenchymatous organs used for food, the various forms of game, foods which are highly seasoned or contain large amounts of blood pigment, should be limited. For other reasons, foods containing much salt are to be avoided.

The best food is milk. It is not toxic, its molecular concentration is less than that of blood, and it is poor in chlorides. There

are, however, some objections. It is deficient in certain food elements, faults easily corrected by the addition of cream and cereals; it contains an excessive amount of phosphates; and still more important, it is subject to fermentation within the gastrointestinal tract.

The second important external source of toxins is the gastrointestinal tract. Fermentative processes of many kinds go on here, producing bodies of great variety, some of which are toxic. Fermentation within the canal must be limited, as far as it can be, by employing foods least likely to ferment. In addition, intestinal antiseptics of various sorts have been employed, but in using them care should be taken to avoid those which in their excretion may irritate the kidneys. Equally important with the limitation of fermentation is the prevention of stagnation of the intestinal contents. Free purgation in these cases is demanded not only because the bowel bears something of a compensatory relation to the kidney, but because in this way absorption of toxins is lessened. It may even be possible that the latter factor is the more important of the two.

In exciting purgation it is better to use the vegetable rather than the saline purgatives, especially if large amounts are required, because the salines have the same influence upon the molecular concentration of the body fluid that sodium chloride has.

Before leaving the question of food supply and fermentation a word should be said of the necessity of individualizing. The diet suited to one patient will not do for another; moreover, each patient's diet must be modified from time to time according to his digestive capacity, the condition of his gastrointestinal tract, the presence or absence of edema, and other factors.

The production of toxic bodies by the organism itself cannot be prevented or lessened below a certain point, for their production is one of the manifestations of life itself. Something, however, can be done toward lessening their production by securing for the patient as perfect bodily and mental quiet as circumstances will permit. The disease itself will force a certain degree of quiet, but often the patients drive themselves to do much which could easily be avoided.

Having limited as far as possible the amount of toxic material introduced into or produced within the body, it remains to lessen its effects by hastening its removal. As already stated, the relative importance of these measures varies and increases with the degree of renal insufficiency. In the milder cases moderate purgation and sweating are sufficient, but in severer cases there is nothing so useful as venesection. The amount of blood withdrawn and the frequency with which the venesection should be repeated depend on the size of the individual and the severity and persistency of the symptoms; but in all cases the phlebotomy should be looked upon as the first resort rather than, as it now too frequently is, the last resort. Bleed early and as often and as much as the symptoms demand. The bleeding is done for the distinct purpose of removing as large an amount of toxic bodies as is possible. It is not done for the purpose of lowering the blood-pressure directly, and should not be reserved for cases with high pressure.

The sweating and purgation are far less effective; indeed, it is likely that the only thing accomplished by sweating is the removal of water. These methods do slowly and incompletely what the phlebotomy does quickly and more effectively. Bouchard estimated that 32 grammes of blood removed more toxins than 280 grammes of fluid feces or 100 liters of perspiration.

In addition to the mechanical removal of the blood, mention should be made of the withdrawal of fluid from the thoracic or abdominal cavity, or from the edematous leg, by hollow needles. The paracentesis is sometimes literally a life-saving operation, the lungs and heart laboring under such conditions that their immediate relief is imperative. Recently the withdrawal of fluid from the cerebrospinal canal by lumbar puncture has been advocated and employed with some asserted good results, but the author has found nothing but failure.

EDITORIAL.

CAN A SPECIFIC DISEASE BE ABORTED?

The question as to whether a disease due to a specific infection can be aborted by any plan of treatment at present known to the medical profession is one which arouses great interest and affords a timely topic for discussion. Prior to our present knowledge concerning the relationship of microörganisms to disease many skilful practitioners of large experience were firmly convinced that it was in their power to abort a number of diseases which we now know are distinctly specific in their origin. In most of these instances the condition was recognized as being actually inflammatory in its nature, but with the discovery that the acute inflammatory process depended upon an infecting microorganism, the belief that the disease could be aborted was diminished because the measures which had been resorted to in no way directly influenced the pathogenic microörganisms. It would seem probable at the present time that while our predecessors were too enthusiastic in their belief that they could abort specific diseases, the physician of the present day is too pessimistic concerning his abilities along these lines, for while it is true that it is practically impossible to influence pathogenic microörganisms in the body by the administration to that body of drugs, it is also beginning to be recognized that remedial measures may so influence the body as to stimulate its abilities to cope with microbic invasion.

Three years ago the writer of this editorial published in the GAZETTE a research in which it seemed to be pretty well proved that the administration of alcohol in proper medicinal quantities in the course of prolonged infectious diseases distinctly increases the ability of the body to destroy infecting microörganisms—in other words, it seemed to materially increase the bacteriolytic power of the blood. Another instance founded upon wide clinical observation, but not upon scientific research, is the wide-spread belief that proper doses of quinine taken in the early stages of an acute cold, or in the early stages of influenza, distinctly modify or abort the disease, particularly if in the latter disease the salicylates are also employed, and of course we have several other instances in which a true specific influence is exercised, as in the case of quinine in malarial infection, the salicylates in acute articular rheumatism, and the use of mercury in syphilis. The actual proof of the mode of activity of the salicylates and mercury in the last-named diseases still awaits, of course, the decision on the part of the pathologist that a definite and specific microörganism is their causative factor. A number of similar instances might be named, but they are unnecessary because those already mentioned serve to illustrate our meaning.

We have read with a great deal of interest in the *Boston Medical and Surgical Journal* of January 31, 1907, an article, bearing the title found above this editorial, by Dr. J. M. French, of Milford, Massachusetts, who begins his paper by carefully defining what is meant by a "specific" or "pathogenic" disease, and what is meant by the word "abort." He admits that the weight of authority is decidedly against the possibility of aborting specific disease, and that it is almost universally assumed that a disease which has once gotten fairly under way must of necessity go on its course uninfluenced by medical treatment. He further points out that any one who makes a claim that a disease has been aborted is exposed to the accusation of having made a wrong diagnosis. Another point of importance which he emphasizes,

however, is that nature itself often aborts disease, and this leads him to a belief which we have already stated, that if nature can abort specific infection it may be quite possible for the skilful physician to so aid nature as to enable the system to successfully cope with pathogenic infection. That nature does abort specific disease in many instances is, we think, the experience of every active practitioner. Thus, it not infrequently happens that the crisis of pneumonia appears as early as the third day. It may be stated, on the one hand, that this is due to a mild infection, but there is no proof that it is not due to an ordinary infection which has been successfully opposed by great vital resistance. Again, many cases of coryza can certainly be aborted during the first twenty-four or forty-eight hours if they are properly treated, and we firmly believe that all these instances of coryza are distinctly infectious in their nature; and diphtheria can certainly be aborted if the antagonistic powers of the body are aided by the injection of antitoxin, which, acting with the ordinary antitoxin of the patient's blood serum, wins the day.

An immense amount of evidence can be adduced that the body possesses a host of measures for its own protection. In some instances protection is afforded by the action of antitoxin; in other instances by the ability of the blood serum to destroy and dissolve microörganisms; in still other instances the battle is won by the aid of phagocytes; and in some cases doubtless all these factors join together in protecting the system from disease. Again, it is well known that large capillary areas possess greater power in destroying toxic materials, whether these capillary networks be in muscular tissue or in the liver. And, again, it is a well-recognized fact that specific inflammations produced by many microörganisms are accompanied by the accumulation of an immense number of leucocytes and phagocytes, and by the presence of large quantities of bacteriolytic serum which at once flood the area to destroy its invaders. Finally, we all recognize that certain individuals in a good state of health are able to combat infections which others in a depraved state of health cannot withstand, and we are wont to speak of this state as one of high or low vital resistance. All these facts seem to us to point, therefore, to the conclusion that it is possible by proper remedial measures to aid the system in aborting specific diseases. The wide-spread use of Dover's powder, hot drinks, and sweet spirit of nitre in the early stages of acute colds, which proves that they produce good results in a certain proportion of cases, is we think an indication of the ability of based upon scientific research his ability to combating infection.

It is quite true that from the standpoint of the strictly scientific laboratory worker there is little evidence to prove the correctness of these opinions. No one has greater respect for laboratory investigations, and the conclusions which can be drawn from them, and no one recognizes their importance more fully than the writer, but every practicing physician knows full well that were his means of treatment cut down to and limited to those measures which are based upon scientific research his ability to treat disease would be very limited.

It is our duty to study this matter of the ability of the body and the physician to combat specific infection, and to endeavor, if possible, to reach more accurate and less empirical results than we have at present. We should endeavor, whenever possible, to find for our methods a scientific basis, and where this cannot be found to employ empirical measures which have been found useful until a scientific explanation is forthcoming. We are glad to find that Dr. French holds views very similar to our own, for he concludes his paper with these well-chosen words: "Is it not better to admit the possibility of improvement, and then go to work with all our might to make the possibility a reality, instead of spending our time in crying out, 'It is impossible, it is absurd, it cannot be done'—a cry which has been uttered in the face of all progress since time began."

THE PERSONAL EQUATION IN THE TREATMENT OF DISEASE.

One of the strongest arguments against the employment of ready-made formulæ lies in the fact that by their use the physician is prone to practice medicine by a routine method rather than by careful analysis of the needs of every case which comes under his care, for a ready-made formula necessitates the administration of identical doses in every case, whereas the prescription which is written for the patient immediately under observation naturally varies in the quantity of its ingredients according as to the predominance of certain symptoms. Not only is routine practice, without careful observation of the idiosyncrasies of the individual patient, a thing to be condemned for the reason just given, but also because it changes the practice of medicine from being an intellectual pursuit to that of a humdrum method of existence. It is only by the constant exercise of an active mind that the peculiarities of disease in individuals can be carefully estimated, and a mind which becomes inactive through disuse along these lines is not, at the end of a number of years, fully qualified to deal with the very complex problems which continually present themselves to physicians. Many years ago Moxon said, "It is as important to know what kind of a patient the disease has got as to know what kind of disease the patient has got," and perhaps we may add to this aphorism that much depends upon what sort of a physician is attending the patient. While it is perfectly true that certain of the manifestations of disease must be directly attacked by therapeutic measures, it is equally true that the patient must be treated rather than the disease itself, and, as we have so often emphasized in these pages, it is essential to remember that in a large proportion of instances the system of the patient is better qualified to deal with a disease, if left to itself, than if it has to withstand at the same time meddlesome interference.

By the exercise of the mental acuity which is essential to success in dealing with the questions which constantly arise in his professional life the physician has an opportunity of enjoying his career, whereas routine methods are quite capable of making his life intolerably stupid and dull. As Osler has well said, "the practice of medicine is very much as the physician makes it. To one it is a worry, a care, and a perpetual annoyance; to another, a daily joy, and a life of as much happiness and usefulness as can well fall to the lot of man;" and, again, he emphasizes the maxim of Moxon when he says that "we must learn to appreciate the differences between the description of a disease and the manifestations of that disease in an individual."

ANOTHER REPORT UPON THE RELATIONSHIP OF QUININE AND HEMOGLOBINURIA.

Readers of the THERAPEUTIC GAZETTE during the last fifteen years are well aware of the fact that this journal has during that time provided them with considerable information in regard to this important question. Within the last year or two it has not only taken the stand that quinine is capable, under some circumstances, of inducing hemoglobinuria, but that it should be given to patients suffering from this condition only when an examination of the blood reveals the presence of the malarial parasite. It should not be given in those cases in which the patient is suffering from malarial cachexia without actual presence of the malarial germ. Our attention has once more been called to this matter by an article by Ketchen, which appears in the *British Medical Journal* of November 10, 1906, which records his experience in Cape Town, Africa. In his report the fact seems to be proved undoubtedly that hemoglobinuria invariably followed the administration of quinine, even if it was given in small dose, and even after the patient had been free from any acute attack of blackwater fever for

fourteen months. Ketchen then recites the investigations of Koch, Plehn, and others in support of the idea that there is a direct relationship between the administration of quinine and the development of this symptom, and we are quite in accord with this belief. The point is also brought out, which we have called attention to in these columns, that the hemoglobinuria may perhaps depend for its existence upon the presence of some other parasite in the blood which is not yet recognized, and in fairness to the subject he quotes Manson and the writer of this editorial as advocating the use of quinine if the malarial parasite is found in the blood, and in withholding it if no such positive discovery is made in those patients who give a history that its use produces this symptom.

INTOLERANCE OF FATS.

We have read with a great deal of interest a most interesting and valuable article on this subject, by Edsall in the *Boston Medical and Surgical Journal* of December 23, 1906, in which he discusses in an exhaustive and lucid manner the inability which many persons have to digest fatty foods. One of the important points which he emphasizes is that in the endeavor to make certain persons gain in weight physicians and the laity are very prone to order quantities of fat which are quite beyond the abilities of the patient to utilize. Indeed, in many instances one of the reasons why the patient is thin is not that there is an inadequate quantity of fat in the food, but an inability on the part of the organism to utilize the fat which is ingested. Not only is this true, but there can be no doubt that the taking of considerable quantities of fatty food is not only capable of disordering digestion but also of seriously interfering with nutritional, or metabolic, processes in the body, and with our increasing knowledge of metabolism in diabetes it is evident that it is quite possible that the too free use of fats may produce serious conditions. One class of cases in which fatty indigestion is by no means uncommon is found in infancy, in which the use of too much cream and milk, or too much fatty food of another character, not infrequently results in looseness of the bowels associated with curdy masses in the stools, which indigestion is usually credited to casein and not to fat. In other instances the child is inordinately constipated, and hard, dry stools, consisting largely of soap, are passed by the patient.

Gastric disturbances from the ingestion of fats are also by no means uncommon. In this connection we must consider the influence which fats are supposed to exercise upon gastric hyperacidity. In some instances it is, of course, true that the generous use of fats diminishes hyperacidity. But on the other hand there are some cases in which their use greatly increases the sense of discomfort, of burning, and of acid eructation, which symptoms entirely disappear when fats are removed from the diet list. So, too, some of the cases of cyclical, or recurrent, vomiting seem to have their origin in an excessive use of fats; the word "excessive" being applied with equal correctness to persons who cannot digest small amounts of fats as to persons who rebel when large quantities are given.

In many cases of jaundice and hepatic inactivity arising from other causes fats should be absolutely removed from the diet; and this becomes evidently important to remember when we recall the fact that some of the cases of recurrent vomiting are perhaps due to acid intoxication.

The examination of the stools for the purpose of determining whether there is an inability of the digestive apparatus to deal with fats is not as satisfactory as it might be, and the methods of inspection and analysis which are commonly employed by busy practitioners are quite inadequate to determine the quantity of fat which escapes from the bowel with any accuracy.

In some instances it may appear from a superficial examination of the patient's diet list that fats are not being taken in any quantity which can be considered deleterious, but a careful examination of the sub-

ject will reveal the fact that they are nevertheless ingested in greater proportion than the patient can handle. Thus, there are a certain number of persons who are unable to digest the yolk of eggs chiefly because of the fats which they contain, these people being quite capable of digesting the white of eggs.

This whole subject is one which requires careful and accurate investigation. There is no doubt that it has been greatly ignored in the past, and that at the present time our knowledge concerning it is very crude as compared to our knowledge of the digestion of starches and proteids.

THE TREATMENT OF SHOCK.

That the value of the lessons taught by Crile in his experimental and clinical work on shock has been taken to heart is well shown by a symposium on this subject in the *International Journal of Surgery* for February, 1907. It is noticeable that all the authors, including Dawbarn, Wainwright, Gwathmey, Herrick, and Hammond, practically reject drugs, with the single exception of morphine. In strict accordance with Crile's findings they are particularly opposed to the use of strychnine, agreeing thoroughly with the dictum that if this drug has any effect in shock it is hurtful rather than beneficial.

Dawbarn, who does not differentiate between shock and hemorrhage, particularly insists upon the value of intravenous injections of hot saline solution, injecting into the long saphenous vein because of its size and ease of access solutions at a temperature of 118° to 120° F., and advising that these be given at the proper time, namely, upon the operating table and before the shock has shown itself. He holds that if the shock strikes first no therapeutic means are of avail. He urges that the dose must be repeated to maintain its good effect. For this purpose he ties a cannula with stop-cock in the vein; to the latter at intervals an irrigator is attached. He cautions against the introduction of more than a few ounces at a time after the primary two quarts, and believes the addition of a little adrenalin chloride to the solution is distinctly serviceable.

In operating upon the head and neck he is opposed to even temporary clamping of the carotids, but resorts instead to cording of the limbs to accumulate blood in them.

As a further means of combating shock he strongly advises if operations are prolonged that they should be performed in sequence—*i.e.*, that an opening of the skull should be done one day, and at a later period, when the patient has thoroughly recovered from his first operation, the cerebral part of the operation should be completed. He also mentions cocaine blocking as a means of avoiding shock, since this condition is due to sensory impulses which exhaust the vasomotor center in consequence of the primary stimulation. He notes, however, that after the effect of the cocaine has passed off shock will develop, and it would seem probable therefore that with some chemical less evanescent in its effects than cocaine or tropacocaine or stovaine we may give these vital centers more time, and so save some patients who now die.

Wainwright on the basis of an experimental and clinical study is enthusiastically in favor of local blocking or spinal anesthesia as an absolute inhibitor of shock. He finds in ether a drug which in itself is capable of producing a condition of shock, and concludes his article by the statement that "the time has come when none of us can justify ourselves either in our own minds or in the courts if we lose an amputation case and have not employed these simple and thoroughly demonstrated means to give our work the greatest degree of safety. The fatal nerve impulses must be blocked either by seriatim injection of the important nerves or by spinal analgesia. I feel that the time is at hand when the procedure in my last case noted will be the usual one. This is: no ether, formal exposure, injection of the

large nerve trunks, and temporary ligation of the main artery."

Gwathmey, who is anesthetist to the Gouverneur, the New York, Skin and Cancer, the City, and the Polyclinic Hospitals, states that in hundreds of cases in which anesthetics are given, over 50 per cent are shocked more or less from the anesthetic. He states that in all major operations the injection of normal saline solution per rectum, before the patient is taken from the table, and inhalations of oxygen for thirty minutes after the operation is concluded, are measures intended to assist in getting rid of all the anesthetic that may still remain in the blood, thus preventing postoperative shock. He also advises that as soon as consciousness returns the patient should be allowed to drink as much water as is desired. If it is vomited the stomach is washed out; if it is retained the patient is in better condition with the diluted ether saliva than if the water had not been taken. With the anesthesia properly induced and maintained he holds that there is a tremendous strain upon all the vital functions; to avoid all shock after the operation the room should be darkened, quiet maintained, and the patient allowed to sleep until he awakens naturally. The patient should be able to answer questions intelligently within fifteen minutes after the conclusion of the operation.

Undoubtedly the greatest advances made in modern times in the treatment of shock are in the direction of prophylaxis. The avoidance of hemorrhage, the preservation of the body heat, deft and rapid operating, the limiting of incisions, rational preoperative preparation, including the insurance of the active functioning of the excretory organs, and, perhaps most important, the tendency to select skilled anesthetists, are factors in the general lessened mortality from shock.

The blind enthusiasm for strychnine in the treatment of shock when once developed, an enthusiasm which still swells the mortality in many hospitals, is an evidence of the power of habit and accepted usage.

When shock is incident mainly or entirely to hemorrhage the intravenous injections have proven their value. A still more serviceable procedure, one distinctly live-saving in desperate cases, is that of blood transfusion by suturing an artery of the donor into the vein of the donee. This Crile has shown to be perfectly feasible. In the ordinary conditions of shock following prolonged operation Murphy's slow rectal injections of normal saline, combined with elevation of the foot of the bed, are usually adequate. As a means of determining the onset of shock the careful observation of a skilled anesthetist should prove adequate for ordinary purposes. It is desirable, however, that this should be supplemented by a sphygmomanometer. The Riva-Rocci form is so cheap and so readily adjusted that it should form a part of every clinical armamentarium.

HERNIA IN CHILDREN.

Hernias observed in children are usually of the umbilical and femoral variety. Though there are many individual cases of femoral hernia reported this condition is comparatively rare before the age of puberty. Those who have much to do with the surgical treatment of children are struck by the number of cases which present themselves with hydrocele of the cord, and which have nearly always been treated as though this condition were hernia. This perhaps is the only condition, certainly the only condition in infancy, which is likely to lead to error. The umbilical hernias rarely call for operation, being readily cured by pressure, best applied through the medium of a flat surface secured in position by an adhesive strap.

In regard to the inguinal hernias, however, the general opinion of the profession is undergoing a change. It was formerly held that the great majority of such ruptures could be cured, and permanently cured, by a properly fitting truss. That many can be so cured is beyond question. As to whether or not this cure is a per-

manent one is open to considerable doubt. There can be scarcely any question but that many of the hernias occurring in later life are the sequelæ of a congenitally patulous condition of the vaginal tunic. Moreover, large experience in the operative treatment of infantile hernias has proven that the surgical procedure is practically devoid of danger, and gives even better results than does this operation when practiced upon the adult.

Clogg (*British Journal of Children's Diseases,* No. 9, vol. iii, 1906) has contributed an admirable article upon the subject of children's hernias in which he states that Cushier has reported a femoral hernia in a fetus, that Coley's youngest femoral hernia was two months old, and that Bull in a series of 1500 cases of hernia in children notes that 15 were of the femoral type.

Hernia of the obturator type is still more rare, though Berger saw one in a child two years old.

In the umbilical hernias of children two types are recognized, congenital and the infantile. As to the frequency of this defect, it is estimated that about one out of every 5000 children exhibits it.

The congenital hernia depends upon arrested development of the abdominal wall. The peritoneal investment is lacking, the viscera being covered only with amnion. Such hernias must necessarily be present before the third month of intrauterine life. The type which is of surgical interest contains a coil of intestine with or without the omphalomesenteric duct or its remains, adherent on the inner surface of the sac. The congenital umbilical hernia forms after the third month of intrauterine life at the time when the peritoneum covers the umbilical ring. The peritoneum and the amnion are united by connective tissue, often of a gelatinous nature. Small hernias of this kind, often called hernias into the umbilical cord, contain a coil of small intestine with or without diverticulum, and are often associated with other deformities. The diagnosis is usually perfectly obvious, and the

Infantile umbilical hernia appears some days or weeks after birth and is due to imperfect closure of the umbilical ring. It is usually noted in the weaker, *i.e.* the upper, part of this ring, and is especially likely to develop in feeble, rickety children. Divergence of the recti is rarely noted. Strangulation is extremely rare and cure is generally accomplished simply by pressure. Clogg reports a case of strangulation in a child fifteen months old, and Turner a case seventeen months old.

Direct inguinal hernias are extremely rare in children; neither Bull, Coley, nor Carmichael have noted a single case. Oblique inguinal hernias are classified as acquired and congenital. The development of acquired hernia implies weakness of the abdominal muscles, peritoneal bulging occurring at the weakened spot. In children such weakness does not exist, the internal oblique muscle being very well developed. In large hernias such weakness, if it be found, is the effect of the hernia rather than the cause. The sac in children may be regarded always as congenital.

Clogg classifies these oblique inguinal hernias as partial funicular and total funicular, the total being one in which the processus vaginalis is patent, the partial one in which the processus vaginalis is obliterated at some part and its upper portion only forms the sac. In the encysted type of sac the processus vaginalis is obliterated at a spot some distance above the testicle, and a partial funicular sac bulges into a capacious tunica vaginalis, which may or may not contain fluid.

Clogg points out that the popular conception that the sac in infancy and childhood is a total one is entirely wrong. In a series of 100 operations upon male children (excluding, of course, those cases associated with an imperfect descent of the testicle) Clogg found a total sac in only seven. Carmichael found a total sac in seven cases out of 133 radical cures performed, whilst Campbell estimates a total sac in about five per cent of cases.

funicular sac. The cecum is a fairly frequent content of the right hernial sac. Of great interest are those cases of cecal hernia with an incomplete sac, variously called "congenital cecal hernia" or the "sliding" type of hernia. In this variety the cecum raises the posterior wall of the sac, the peritoneum is reflected from the sides of the cecum to the sac wall, leaving the posterior aspect of the cecum uncovered by serous membrane. This uncovered area may extend some distance into the scrotum. These cecal herniæ are often irreducible, are difficult to retain by a truss, and not infrequently become incarcerated or even strangulated.

Stiles found the cecum present in the sac in seven per cent of his cases. In all of these the sac was complete, while in two instances the lower end of the mesentery was attached to the posterior wall of the sac and had to be divided before the bowel could be returned within the abdomen to enable a ligature to be put sufficiently high around the sac. The sliding type of cecal hernia can be expected to relapse more frequently than those hernias with a complete sac, since there is no neck to close and the peritoneum around the internal abdominal ring cannot be made taut.

Hernia of the bladder may develop without a sac, a rare variety in which the anterior or lateral surface uncovered by peritoneum enters the inguinal canal; with incomplete sac, in which the bladder raises the sac-wall, and is only covered on one aspect with peritoneum, the common type; and with a complete sac, a very rare form, in which the protruded portion of the bladder is completely surrounded with peritoneum.

It is fairly easy in isolating the neck of the sac and dragging upon the peritoneum to draw the bladder into the wound. It is usually preceded by a mass of peritoneal fat, which should be regarded as a warning that further traction will be likely to expose the bladder wall.

Two instances of tuberculosis of the sac are reported by Clogg. He also records eight cases of strangulation, the youngest being five weeks old. Usually the reduction under ether is simple. This accident occurs within the first twelve or eighteen months of life, usually within the first six months.

The treatment of infantile hernia is operation, usually after the sixth or eighth month, unless this entails weaning of the infant. The indications for operating earlier are strangulation or symptoms threatening this condition, large size of hernia, or impossibility of retaining by a truss. Clogg states that if the baby be bottle-fed the operation may safely be undertaken in the fourth month.

Clogg incises the external oblique from the apex of the external abdominal ring upward and outward a little distance above Poupart's ligament, believing that the internal ring cannot be sufficiently exposed without freeing the inguinal canal. The sac is readily identified by stretching fully the tissues of the cord and incising the cremaster fibers which spread out over it. The sac is opened, and the cord is easily separated. The sac is freed up to the internal ring, is drawn upon, freed about the neck, clamped, twisted, ligated, and removed. An excess of subperitoneal fat on the inner side is taken as a warning that the bladder is near. A total funicular sac is divided a little below the external ring, the scrotal part being allowed to remain without further attention. In the majority of cases with a well-developed internal oblique Clogg passes a couple of sutures through it, the torn cremaster, and Poupart's ligament over the cord. In large hernias and those where the internal oblique has been weakened, a more secure wall is made by suturing these structures behind the cord. The cut margins of the external oblique are either sewn together or, if this tendon is lax, are overlapped by two layers of sutures. A deep suture is then employed in the subcutaneous tissue to avoid any reactionary hemorrhage, which may readily occur from the thick layer of subcutaneous fat developed in this region in infants. The skin edges are approximated by a subcuticular suture.

REPORTS ON THERAPEUTIC PROGRESS.

FURTHER OBSERVATIONS ON THE USE OF ADRENALIN IN PLAGUE.

CHOKSY in the *Indian Medical Gazette* for February, 1907, reminds us that in a previous communication to the *Indian Medical Gazette* preliminary observations with adrenalin in this disease were related. They indicated that adrenalin exerted a distinctly beneficial effect upon the circulation by increasing the pulse tension, remedying its irregularities and steadying and sustaining the action of the heart, until such time as the system was able to eliminate the toxins, and bring about recovery. The full measure of the effects of the drug could not, however, be demonstrated, inasmuch as it was tentatively employed and other drugs were simultaneously used. Nor was it then possible to determine in what doses and with what frequency it could be exhibited; the limit of its usefulness, as also of its tolerance, and finally its ill effects, if any, had to be established. Further observations were therefore undertaken at the Maratha Plague Hospital during 1905, when adrenalin was used throughout the whole period of the epidemic, and certain data having been obtained, its use was still further extended during the epidemic of 1906. It is the purpose of this article to summarize the results of the above observations.

The main object of the observations, in 1905, was to compare the effects of small, medium, and large doses of adrenalin, to fix the limit of the safest single maximum dose, to determine the frequency of its administration, and to record its after or ill effects. Correct records of the amount administered and its frequency were kept and the effect upon the circulation carefully noted. As during the height of the epidemic Yersin-Roux antiplague serum was also employed, it was possible to institute comparison between those cases treated with the serum and adrenalin and those without. Full confidence having yet to be established in its utility, it was determined to use it simultaneously but in alternate doses with the stimulant injection previously described (strychnine, sparteine, and atropine). In order to allow of facility in administration and exact dosage, it was prescribed in the following formula:

℞ Adrenalin solution, min. 5;
Normal salt solution, q. s. ad ℥j.

The initial dose of the above varied from one to three drachms every three or four hours according to the condition of the pulse. If there was no improvement, or if the pulse became steadily worse, the dose was increased from four to six drachms and the frequency to two hours. When so prescribed, it was not found practicable for various reasons to administer twelve doses in the twenty-four hours, and the daily average in grave cases therefore came to about ten doses, equivalent to about 300 minims of adrenalin solution. This maximum dose was kept up for three or four days, sometimes longer, and after the pulse exhibited sustained improvement it was gradually reduced by one drachm at a time, and subsequently at longer intervals. The doses were gradually decreased as the patients' condition improved, and in by far the largest number of cases it was entirely stopped by the end of the second week. Even after sustained improvement in the condition or the circulation, it was found that abrupt stoppage or too great a reduction in the dose was not safe. It soon reacted unfavorably upon the pulse, necessitating increased dosage. The decrease should therefore be always gradual, and its effects require careful watching. If the maximum dose failed to have any effect, the condition of the patient was practically hopeless. In those cases in which the circulation did not improve, notwithstanding the disappearance of all acute symptoms and general amelioration, it had to be kept up, and some patients received adrenalin in small doses for periods extending from six to eight weeks without any apparent harm.

In order to grasp fully the results obtained under the above method, it would be necessary to revert for a time to the results of the previous observations of 1904, which were as under:

Line of treatment.	Number.	Died.	Recovered.	Case mortality. Per cent.
Stimulant and camphor injections	324	268	56	82.7
Stimulant injection, adrenalin (by mouth)	598	416	182	69.5
Adrenalin only (mostly subcutaneously)	70	47	23	67.7

The above statement indicates that adrenalin used by itself had greater influence in lowering the mortality than when employed simultaneously with the stimulant injection, and further that the combination of stimulant injection and adrenalin showed better results than the older method of treatment by stimulant and camphor injections only. The results of the observations of 1905 may now be stated as follows:

Line of treatment.	Number.	Died.	Recovered.	Case mortality. Per cent.
Stimulant injection plus adrenalin	1038	810	228	78.0
Adrenalin injection plus Yersin-Roux serum	222	138	84	62.1

The foregoing table demonstrates that the combination of adrenalin and serum exhibited the best results, as also the fact that among the cases treated without the serum the results, although less favorable than those of 1904, were still better than under the older plan of treatment. Included in the above series are 241 cases to whom adrenalin was administered subcutaneously in doses of 10 minims mixed with an equal quantity of normal salt solution, eight to ten times during the day, the stimulant injection having been administered by mouth with water. The effects of this method of exhibition were not so marked, and the mortality was higher by nearly 7 per cent.

The above results, if analyzed according to the doses administered, and their frequency, furnish some instructive data. As the ultimate fate of every plague patient depends upon the extent of the cardiovascular paresis and of the degenerative changes in the myocardium as well, the action of any drug, however potent, is subject to considerable limitations. Given a moderate degree of toxemia and early treatment, a drug would exert far better effect and in much smaller doses than under other circumstances where these conditions do not prevail. And it has also to be recognized that the response from powerful stimuli would not be so rapid nor so durable where degenerative and paralytic changes have advanced far. Nor can any drug counteract such tissue changes as have been already brought about by the toxemia. Thus out of 1019 patients who received adrenalin by mouth, it was only in 144 that the conditions could be said to have been at all favorable, and where moderate doses of adrenalin varying from 5 to 15 minims had the desired effect. The rate of mortality among them was 37.5 per cent only. On the other hand, 875 patients received large doses, varying from 20 to 30 minims every two hours; 451 patients could be kept alive under them for two days, 297 for five days, and 127 patients for six days and over. The rate of mortality among them was 883—71.1 and 65.5 per cent respectively. That is to say, in more than half the number of cases the circulatory system was so gravely affected that adrenalin could sustain the heart's action for about two days only; on the other hand, where the conditions, though grave, were more comparatively favorable, life could be prolonged for five or six days or even longer and a few more lives eventually saved. The sustaining action of adrenalin is thus well demonstrated:

Dose of adrenalin in minims.	Number.	Case mortality. Per cent.
5 to 15	144	37.5
20 to 30: administered		
for two days	451	88.8
for five days	297	71.1
for six days and over	127	65.5

The above figures indicate the gravity of the cases dealt with, and the narrow borderline that always exists between life and death in plague. The main purpose of the

above observations having been thus served, greater confidence was established in the usefulness of the drug, and it was resolved to employ it solely during the epidemic of 1906. The stimulant injection was therefore discarded; in those cases in which nervous prostration or coldness of the extremities required temporary stimulation, camphor injection was used. The only deviation in the method of administration was that instead of gradually increasing the dose of adrenalin from 15 minims upward, as the condition of the circulation grew worse, rather full doses were given initially, but in no case exceeding 30 minims every two hours. The effect of this was soon apparent upon the pulse, which became almost at once steady, and was maintained at a more or less uniform level throughout the acute period of the illness. If the pulse maintained this improvement for four or five days, the dose of adrenalin and its frequency were gradually reduced. The advantage of this method lay in the fact that the initial full dose steadied the circulation and prevented its getting worse, and thereby saved the heart, and finally it contributed to a greater saving of life. The above method was carried out from January to June of the past year, and comprised 802 cases, of whom 575 died and 227 recovered, equivalent to a case mortality rate of 71.6 per cent. From June to October 102 patients were treated with adrenalin administered subcutaneously in doses of 20 minims every two hours, the patients, however, receiving ten doses only in the day, equivalent to 200 minims of the drug. There were 65 deaths and 37 recoveries—that is, a case mortality of 63.7 per cent. If we now tabulate the above observations extending over three epidemics, we see how the results have worked out under the varying methods of treatment:

Line of treatment.	Number.	Died.	Recovered.	Case mortality. Per cent.
Adrenalin (by mouth), stimulant injection	1636	1226	410	74.8
Adrenalin (by mouth)	787	571	216	72.5
Adrenalin (subcutaneously)	157	105	52	66.8
Adrenalin, Yersin-Roux serum	252	152	100	60.3

The adrenalin when used by itself has given better results than when employed alternately with the stimulant injection. The hypodermic method has much in its favor in view of the still better results, and finally the best results are seen under the combination of adrenalin with the Yersin-Roux serum. These observations having extended over three epidemics, it may be argued that the later and better results may have been due to lesser virulence of plague; that such was not the case is indicated by the following statement showing the number of attacks and deaths reported in Bombay:

Year.	Attacks.	Deaths.	Case mortality. Per cent.	Case mortality, excluding patients treated in the Plague Hospital.
1904	15,488	13,538	87.40	89.20
1905	16,208	14,198	87.06	88.48
1906 (8 mos.)	11,864	10,466	88.18	90.94

The general mortality rate has been about the same, if at all a trifle higher during 1906; if hospital cases were to be excluded, the normal plague mortality would be between 89 and 90 per cent, a truly appalling rate, indicating the extreme virulence of the affection in Bombay.

VERTIGO.

In the *Kansas City Medical Index-Lancet* for November, 1906, ROBINSON says that the treatment of vertigo is the treatment of the morbid state which is causing the vertigo. If ocular, correct the error of refraction or the muscle incoördination. If gastric, correct the digestive disturbance. If hemic, correct the morbid state of the blood or the weak heart action, or, as far as possible, stop movements that bring on the vertigo in anemia resulting from arteriosclerosis. In incurable organic brain disease, in which vertigo is a symptom, drugs such as the bromides, which decrease the irritability of the equilibratory centers, will be indicated. Aural vertigo resulting from impacted cerumen in the external auditory canal will disappear when the cerumen is removed.

Curable middle-ear disease occasionally

causes vertigo, and the vertigo disappears when this morbid state is cured. All forms of reflex aural vertigo can be relieved by correcting the morbid state causing the vertigo.

Vertigo resulting from the morbid state of the labyrinth is the most difficult to treat successfully. There are many reasons for believing that these result from irritation of the vestibular nerve endings. If there be degeneration of any of the labyrinth structures, when the degeneration is complete the vertigo ceases. The bromides give considerable relief in these cases by lowering the irritability of the coördinating centers. In the very severe cases destruction of the entire middle ear may be done with satisfactory results. Charcot recommended large doses of quinine in chronic Ménière's disease. Church recommends pilocarpine in acute cases, and in obstinate chronic cases with impaired hearing removal of the malleus and incus and immobilization of the stapes will often give relief.

TREATMENT OF SOME EYE DISEASES BY THE GENERAL PRACTITIONER.

In the *Virginia Medical Semi-Monthly* WILKINSON discusses this subject and reviews the diagnostic points of the four conditions mentioned in his paper.

Conjunctivitis.—Always a discharge; pupil always dilates freely; cocaine dilates pupil; sensation of burning, pricking, and of foreign body; some photophobia.

Ulcer of Cornea.—Usually a discharge; great photophobia; the continuity of cornea has been broken at some point; there is usually a decidedly white, ulcerated spot. When there is any doubt as to whether the cornea is involved, this can be determined by instilling first a solution of cocaine, 2 per cent, followed in two to five minutes by an instillation of fluorescine, 1:100, followed again by a drop of cocaine. If there is an ulcer this will stain it yellow, and it becomes very distinct.

Iritis.—Small, usually ragged, irregular pupil; discolored iris, deep-seated inflammation; pupil not dilatable with 2-per-cent solution of cocaine; pain in eye and temple, worse at night; little or no discharge; normal tension; some photophobia.

Glaucoma.—Hard eye; great pain in eye and temple, sudden in onset; steamy cornea, slightly dilated pupil, but regular. Shallow anterior chamber.

In conclusion he offers a few don'ts in ophthalmology:

1. Don't treat an eye until you know what is wrong with it.

2. Don't use a poultice of any kind on the eye. Poultices have done more damage than they have ever done good. They mask the symptoms and cause rapid ulceration and breaking down of tissues.

3. Don't use atropine in the eyes of persons above the age of forty years, unless you are absolutely certain that you have a case of iritis.

4. Don't use acetate of lead in ulcers of the cornea. You will get a lead deposit in the cornea.

5. Don't use cocaine in ulcers of the cornea. It causes a degeneration of the epithelial membrane and invites ulceration.

6. Don't treat your chronic headache and migrainous patients for years with pills, purgatives, and coal-tar preparations, but send them to a competent oculist and have them fitted with glasses.

THE ADMINISTRATION OF CREOSOTE.

Creosote may be given in capsules, but, as has recently been pointed out by Dr. BOUCHET (*Progrès médical,* Sept. 1, 1906), the gelatin may dissolve in the stomach at a moment when the organ contains no food, or if the precaution has been taken to swallow the capsule only after eating, at such a point as to let its contents out against the bare wall of the stomach. In that case an irritant action must be exerted, possibly a caustic effect.

Apparently M. Bouchet has devoted a good deal of thought and care to the problem of administering creosote in an inoffensive manner. His investigations have led him to the conclusion that an excellent way is to mix the creosote with powdered charcoal in the proportion of one part of the former to two of the latter by weight.

Having been dried, the powder is done up in the form of wafers, each containing the proper dose of creosote. It might be preferable to put the powder into capsules as a mere matter of convenience. Several of them can be taken at a time if the dose is too bulky to be contained in a capsule small enough to be swallowed readily.

There is some loss of weight during the drying process, which lasts half an hour, no heat being used. One-sixth of the original weight is lost. Of course this loss is of creosote alone, though M. Bouchet suggests that the creosote simply parts with "humidity," and consequently becomes more concentrated. One might disregard that doubtful point, and adjust the doses to the patient's tolerance. Even the addition of charcoal does not render creosote wholly acceptable to the stomach, but it would doubtless do away with the irritation that might follow the administration of capsules filled with undiluted creosote. It is still better to incorporate the creosote with a generous amount of some bland substance, such as curd soap with powdered licorice or althea, and put the mixture at once into capsules.

THERAPEUTIC VALUE OF THE X-RAY.

EDSALL writes on this topic in the *Journal of the American Medical Association* of November 3, 1906. After discussing the points that should limit or discourage the use of the *x*-ray, he says that an agent that has such a profound effect on metabolism is not likely to exercise this effect solely in an evil way if proper opportunities for doing good with it are sought out. It is evident already that in leukemia and in some other general disorders metabolism may be stirred up by the *x*-ray to the accomplishment of at least transitory good, and it appears probable that some other disorders of metabolism not yet known to be benefited by the *x*-ray might be improved through its use. Up to the present the observations of the author in this direction, which have been limited in number and have been undertaken only in cases that seemed to be proper to subject to exposures, have remained of little or no therapeutic value, except in one condition, in which they have been quite encouraging.

He has had the *x*-ray used in two cases of gout, a disease that has repeatedly been treated in this way. The clinical results in other instances, as well as in these two cases, have been doubtful or discouraging. The studies of metabolism that he made with Dr. Fife in these two cases, during the time that they were under treatment, showed that the exposures had no influence in stopping or warding off the disturbances of metabolism that are associated with the attacks. Likewise, in two cases of diabetes that were subjected to this treatment, no changes of consequence could be demonstrated in the clinical condition or in the excretion of sugar and acetone bodies. He tried the effect of the *x*-ray, also, on a case of persistent headache associated with a deposit of oxalates in the urine, and while the increase in general metabolism that has usually been observed was noted in this case, there was no change in the amount of oxalic acid that was determined to be present and the clinical condition was not altered.

In several cases of unresolved pneumonia he has had promising results. He used the *x*-ray in these cases because he believed that it would probably act chiefly through increasing the velocity of some ferment processes, and because in unresolved pneumonia it is probable that the ferment processes that should and ordinarily do dissolve the exudate are ineffectual. In three such cases the clinical effect was a rapid clearing up of most or all of the signs, and in two of these cases in which Dr. Pemberton and he studied the metabolism they observed a tremendous influence that was coincident with the improvement in the physical signs, the metabolic alterations having been of much the same quality and degree as those that are seen at the time of an ordinary successful crisis. These latter results are, then, encouraging. While the others mentioned are not so, the author believes that there is certainly constructive work to be done in searching out the therapeutic relations of the *x*-ray, and not simply

the more destructive type of work that he has chiefly discussed earlier. This is particularly true if the work be planned with a view that this agent has a lively influence on metabolic processes, particularly on those that occur in the spleen, the lymphatic tissues, and the bone-marrow, and if it be carried out with a calm but definite appreciation of the restrictions that should be placed on any such experiments in therapeutics.

INTESTINAL ANTISEPSIS.

In the issue of the *St. Louis Medical Review* of August 18 a note from the *Boston Medical and Surgical Journal* was published, on the "Fallacy of Intestinal Disinfectants," in which the writer argued on theoretical grounds against the possibility of intestinal antisepsis. On the other hand, history presents us with innumerable examples of things that have been theoretically demonstrated by apparently unimpeachable logic to be impossible, which practical research has nevertheless shown to be facts, and concerning which wider knowledge has subsequently disclosed the fallacy in the hitherto seemingly unanswerable objections. Meanwhile, it is certain that many do believe in the practicability of attaining intestinal antisepsis, and it is significant that such are chiefly to be found among those who have given it a thorough trial.

In the *Georgia Practician* for July, Dr. John Forrest, of Charleston, S. C., admitting that perfect antisepsis is unattainable, even on the outside surface, let alone in the interior of the body, argues that nevertheless "such an approximation is attainable as will change the whole complexion of a case and bring about most satisfactory results from very unpromising beginnings." "Is not perfect health," he asks, "a condition of normal antisepsis? And what higher degree of antisepsis do we require to satisfy us? And yet such a condition is quite compatible with the presence of a countless multitude of microörganisms, some of which we know may even be pathogenic."

We cannot understand why it should be deemed necessary, as many of the opponents of intestinal antisepsis (though not the writer in the *Boston Medical and Surgical Journal,* apparently) seem from their arguments to assume it to be, to kill or injure the microörganisms in order to produce an effective stage of antisepsis. As Dr. Forrest points out, in a state of (as nearly as attainable) perfect health the microörganisms are still there in full force, but the physiological processes of the body are capable of taking care of them, so that the analytical and synthetical consequences of their life processes are rendered innocuous to their host. When human resistance becomes lessened, then the microörganisms "get in their work" as toxic agents; but till then the soil is not suitable. As King Chambers said, so far back as 1861, in a clinical lecture on "Typh-Fever," "But remember there are two things necessary to poisoning: not only the poison, but a person apt to be poisoned." Now, when we find a person whose resistance is so reduced that the microörganisms are able "to get in their work," is it really so very inconceivable that even minute quantities of certain antiseptics, such as may be safely ingested, should be sufficient to alter the dynamic status of the environment in which the microörganisms subsist, enough to render them temporarily impotent for harm? Meantime the human organism is gradually recovering its own powers of defense, sufficient to enable it to keep a conquered people, so to speak, vastly outnumbering the conquerer, in control, as history has shown repeatedly to be the case with regard to various bodies politic.

The human body is not a test-tube. The test-tube is practically inert, and so far as we can see has no part or lot, other than that of a container, in the processes at work in a chemical reaction or a bacteriological culture experiment; the human organism, on the other hand, has a most vital and potent influence. Moreover, one cannot poison the test-tube with either chemical or physiological poisons.—*St. Louis Medical Review,* Nov. 7, 1906.

THE CURE OF PSORIASIS.

In the *Journal of the American Medical Association* of November 17, 1906, BULKLEY reports his results in treating 500 cases of psoriasis. He thinks that as in the case of gout and chronic bronchitis, the psoriatic subject must recognize the existence of a disease of deep-seated nature, which will require the best efforts of the physician and patient, over a long period of time, in order to have it effectually overcome. The author commonly fixes two years (it may be longer) as the least period to be considered at first; and then if after that the patient relapses into exactly the same mode of life and condition of system as previously, there may be a threatening of the eruption. But if, with its slightest recurrence, energetic measures are at once taken and continued, the trouble may be avoided, as the author has observed time and again.

Time forbids going at length into the details of constitutional treatment, so different are the cases, but a few words of suggestion may be given. Mention has already been made of the excellent results sometimes obtained by antisyphilitic treatment, even when no specific history can be obtained, also of the disappearance of the eruption under the free use of nitric acid internally. In full-blooded, plethoric cases, tartar emetic in increasing doses, to toleration, given six times daily, with nux vomica and quassia, has cleared up a number of the author's cases in a surprising manner, without local treatment; but this needs to be followed by a tonic course of iron and arsenic, and perhaps returned to again. In cases in which debility was evident, a strong course of iron and arsenic, with bitter tonics, has had like effect, and the same has been accomplished with cod-liver oil, in suitable cases. There are also many patients in whom arsenic alone, in efficient doses, suffices to keep the disease in abeyance.

Arsenic is so well known that little need be said concerning it. The author has never had occasion to regret its use in suitable cases, and has had patients who consumed large quantities with only beneficial results. The greatest consumer of arsenic was a clergyman, under the author's care more or less for twenty years, beginning at thirty years of age, when he had already had the eruption eight years. He calculated that sometimes he took almost 8 ounces of pure Fowler's solution in the course of a single year, over half a gallon, in drops, in the course of fourteen years. But arsenic does not suit every case nor every stage of the disease. As is well known, it sometimes stimulates the eruption to increased activity, and is seldom of value in its acute or developing stage, but rather aggravates it.

Alkalies, properly used, and such remedies as promote a perfect urinary secretion, are of the utmost value in most cases of psoriasis; and it is here that the value lies in most of the mineral waters used at the springs or at home. But to be really effective they should be administered with a repeated and perfect knowledge of the kidney secretion, as shown by quantitative analysis. The urine should not be kept alkaline, but somewhat below the normal acidity. Acetate of potassium, combined with nux vomica, and the fluid extracts of dulcamara and rumex, are most valuable, especially in the congestive forms of the eruption.

Diet, undoubtedly, has much to do with psoriasis, and should always be most carefully attended to. Alcohol in any form, even the lightest wine or beer, is prejudicial and must be absolutely avoided. Whatever may be the mode of operation, there is no question in the mind of the author, from repeated observations, extending over many years, that meat, especially if freely indulged in, increases the liability to and severity of the eruption, as he reported ten years ago; and he is now more convinced in regard to this than at that time. For many years he has placed numerous psoriatic patients on a strictly vegetarian diet, with most excellent results; and these results are further corroborated by the fact that now and again, when one has broken through the regulations, he or she has reported with a recurrence of the eruption. He makes the diet absolutely vegetarian, not even allowing eggs or fish, or milk as

a beverage with eating, and sometimes he has even excluded coffee and tea with advantage. Excess of sweets also tends to increase the eruption in psoriasis, and these should be greatly restricted; moreover, as the eruption is often increased by dyspepsia, he sees to it that pastry or articles exciting indigestion are also avoided.

Hygiene has a certain bearing on psoriasis, and in an effort to secure a cure of the disease it should always be controlled. This cannot be gone into fully here, but if, as he believes, faulty metabolism is the bottom cause of the malady, every item which can conduce to its perfect performance should be attended to; and unless the physician investigates and directs this, the patient will be apt to live just as before. The author has also elsewhere reported psoriasis profoundly affected by the condition of the nervous system, the eruption appearing with each nervous breakdown, and we all know of the recurrence of psoriasis in connection with lactation. Temperature has much to do with the eruption, as it frequently disappears on removal to a warm climate, and the disease is relatively seldom seen in the tropics.

In regard to local treatment the author has little to say, except that he agrees with the most radical localists in regard to the importance (although not relative importance) and effect of local therapeutic measures; no one who has seen much of the disease could rightly do otherwise. The rapid removal of a long-standing and rebellious eruption of psoriasis by the proper use of chrysarobin, of good quality, is certainly a striking evidence of therapeutic power; but we all know the objections to chrysarobin, and often it is not feasible to employ it in private cases in an efficient manner. Sometimes, however, the eruption does not yield to it, and occasionally it fails owing to an inferior quality of the drug.

The author does not take the time to enter into the details of other local treatment, which are well given in literature, almost every variety of which he has, at one time or another, used in private or public practice. As in all other cutaneous maladies the application has to be fitted to the case, and varies according to the character and stage of the eruption, but time forbids consideration of the subject. However, he does say a few words in regard to the treatment of the eruption by the *x*-rays, in which he has had some interesting experiences. They are by no means suitable to every case, although as yet he has had no unfavorable experiences, except one, among a considerable number of cases thus treated, in part. In this patient, a man aged fifty-five, there was a slight burn on the abdomen, with the same strength of application used elsewhere; but this healed soon, and the results elsewhere had been so favorable that he insisted on having the *x*-ray still employed on other patches, even while this was sore. He has used it only on older, more chronic lesions, and has repeatedly seen a single application of medium intensity remove a patch entirely. It often leaves a brownish stain, which persists some little time. He has had cases in which, although new eruptions developed elsewhere, the portions which had been treated by the *x*-rays remained free. As an adjunct to the local treatment of psoriasis, in proper cases, he considers this new measure a most valuable addition to our armamentarium.

THE TREATMENT OF WATER GAS, CARBURETTED WATER GAS, AND CARBON MONOXIDE POISONING.

At the end of an exhaustive consideration of this subject in the *Lancet* of December 15, 1906, GLAISTER asserts that whether the kind of gas be "producer gas," water gas, carburetted water gas, or ordinary coal gas, the problem to be solved in the treatment of those deeply comatose from inhalation of the gas is how to overcome the association of the carbon monoxide with the hemoglobin and to restore the oxygen-carrying function of the red corpuscles. It will be obvious that the only difference in action of these gases is one of time, due to the difference in percentage of carbon monoxide which they respectively contain; or, in other words, because of the much less percentage amount

of carbon monoxide in coal gas it takes a longer time to produce an equal degree of saturation than in the case of the others. Even in coal-gas inhalation, however, when the person is found to be deeply unconscious, and particularly when ordinary remedial efforts prove unavailing, it is the toxic effects of the carbon monoxide which have to be combated. The first indication in treatment is to remove the sufferer, under suitable precautions, into the open air. By reason of the action of carbon monoxide on the vasomotor nerves producing coldness of the surface of the body these suitable precautions ought to consist of measures calculated to restore surface warmth, which is of considerable importance. Artificial respiration will only be necessary if voluntary breathing be embarrassed or irregular. Inhalations of oxygen should be given. If in spite of these measures no sign of recovery appears, bleeding and injections of saline solution or transfusion of live human blood should be carried out.

Yarrow, in a paper read before the Philadelphia Pathological Society in November, 1899, stated that he found experimentally on dogs that transfusion gave good results, the transfused blood being obtained from the carotid artery of a healthy dog and allowed to pass into the jugular vein, while saline solutions were only of temporary value, and hydrogen peroxide injected intravenously and subcutaneously yielded no beneficial effect. In carbon monoxide poisoning removal into the open air is not so urgently called for, although plenty of fresh air is necessary. The difficulty is to obtain dissociation of the gas from the hemoglobin even by the administration of oxygen, because of the diminished capability of the red corpuscles to absorb and carry oxygen. While artificial respiration, oxygen inhalations, and measures for the restoration of body heat ought to be persevered in until, at least, the animal heat is restored, should no further improvement be manifested, bleeding and transfusion should be resorted to.

THE TRYPSIN TREATMENT OF CANCER.

The reports which have appeared recently in the *Medical Record* on the result of the injection of pancreatic ferments in the treatment of cancer are exceedingly interesting, even if not conclusive. They are certainly of such a nature as to demand further essays of the remedy, though the lessons of the past should not be forgotten, and while trypsin is still on its trial it will be salutary to remember that there have been other remedies which seemed to promise well at first, but which are now, figuratively speaking, collecting dust on the top shelves of the pharmacies, out of sight and out of mind. The weak points in the case of trypsin, so far as it has been presented, are three: the small number of cases, the short time that has elapsed since the reported cures have taken place, and the lack of anatomical confirmation in most instances of the diagnosis of malignancy.

In some of the cases the diagnosis was established by a microscopical examination, and in others, such as the interesting laryngeal case reported by Dr. Rice, the clinical evidence of malignancy would have been accepted as conclusive had the disease run its usual course. But clinical evidence is insufficient in dealing with what is, according to all past experience, so improbable a fact as the absolute cure of cancer. Even a microscopical diagnosis in isolated cases would be brushed aside by the skeptical, if not by the judicial, as possibly erroneous, and the objectors will not be silenced until this diagnosis has been made a number of times by a number of competent microscopists.

The diagnosis being accepted, the number of cases in which the growth has disappeared after the use of trypsin, and the other pancreatic preparations, must be many times what they now are before the medical world will admit that a cure for malignant disease has been discovered. The instances of spontaneous cure of cancer are not few, and the disease has been seen to disappear under many and various forms of treatment. Violet leaves, condurango, thyroid

extract, and even soap have been reported as effective in a number of cases, and it is possible they may have given the fillip needed by nature to enable her to work a cure. Trypsin may act in the same way, or it may be endowed with a specific curative action. The cases thus far reported are too few to warrant a definite opinion.

Time alone can determine the actuality of the reported cures. Recurrence is the rule in all cancer therapy, whether by the knife, the *x*-ray, Coley's fluid, or other remedies, and few, even among those who are convinced that the cases treated were malignant and that the growths have disappeared under trypsin injections, will maintain that there is no possibility of recurrence. Yet that is what we should expect if the theory of Professor Beard, upon which the present experiments are based, is true. It is his belief that if the left-over asexual cells, which are the cancer cells, are once destroyed by trypsin, any further cancerous growth is impossible. The theory, with all its corollaries, is entitled to respectful consideration in view of the reports, meager though they still are, of apparently successful results, but time alone will prove it.

It may be noted, though the fact is not of much weight, that the reports of the results of the trypsin treatment in England have thus far been uniformly unfavorable. The remedy has been tried at the Cancer Hospital, the Middlesex Hospital, and other institutions in London without success, and Mr. Edmund Owen, in a recent lecture on cancer, asserts that there is no known method of treatment of cancer "which can honestly and confidently promise a cure." In explanation of this failure it is contended that the pancreatic extract used was inert, and that it was not administered properly. We have seen no detailed reports of these experiments and so are not in position to judge of their value, but if the trial of this method of treatment in America should eventually prove its worth, it would not be the first instance of a prophet finding honor in a country other than his own. The results of the trypsin treatment of cancer in this country are not yet sufficient to carry conviction, and further trials may result in another disappointment and lead to the abandonment of the method, but we believe such trials are fully justified by the apparent success already obtained.—*Medical Record,* Dec. 22, 1906.

THE THERAPEUTIC VALUE OF COMPLETE VOCAL REST DURING THE SANATORIUM TREATMENT OF LARYNGEAL TUBERCULOSIS.

Sir Felix Simon in the *British Medical Journal* of December 8, 1906, contributes a paper with this title. He believes that complete vocal rest is particularly indicated in cases of inflammatory irritation of the larynx in pulmonary tuberculosis, especially in obstinate catarrh of the larynx, congestion of the vocal cords, relaxation of the ventricular bands, and—in more advanced cases—in circumscribed ulceration of the vocal cords, ulceration in the interarytenoid fold, general infiltration, and in impeded movements of the cricoarytenoid articulation. But we cannot expect anything of it in those hopeless cases of the last stage in which the whole larynx has become a prey to deep ulceration and partial perichondritis, and we also cannot conceal the fact that in a number of cases in which one had from former experience been entitled to hope that it would prove useful the result is disappointing.

Nor can it be denied that even during the stay at the sanatorium the method is very irksome for the patient. Seeing that anyhow—especially at the commencement—the stay at a sanatorium acts rather depressingly upon many patients, this state of matters is further increased by the curtailment of intercourse with other patients, which is inseparable from the employment of the method. Even strong-minded patients have said that they had needed their whole reserve of energy in order to strictly preserve complete silence for a long time. Much depends in this connection upon the temperament of the patients; much also upon the question whether by chance they are together with reasonable or with unreason-

able patients in the sanatorium. Concerning this point, however, diametrically opposed statements have been made. Whilst one patient stated that she had been supported and most sympathetically encouraged by her companions in distress in preserving complete silence for many months, another very energetic patient, whose severe laryngeal tuberculosis has now for years been arrested by means of the silence method combined with local treatment, stated that nothing had rendered his undertaking so difficult as the unreasonableness of other patients in the sanatorium, who had time after time endeavored to tempt him to talk. It is here that the task of the physician to the sanatorium begins. If he will take the trouble to help his patient to successfully go through his difficult ordeal by means of suitable arrangement of the patient's daily life, by prescribing solitary walks, by suitably placing the patient who is to be silent between two other reasonable patients at the common meals, and by instructing the other patients accordingly, he will be able to do very much to lighten the disagreeableness of the method.

One must be prepared for the question whether the results of such religiously-maintained and long-continued silence are worth the difficulties and unpleasantness of the method emphasized. In reply to this question the author is able to state that in quite a number of cases in which it was employed, either alone or combined with suitable local treatment, the results were such as in former times he had hardly ever observed. Obstinate inflammatory irritation, which had defied every local treatment, disappeared; infiltration, if not too much developed, receded; isolated ulcers on the vocal cords, the ventricular bands, and in the interarytenoid fold lastingly healed; and even motor disturbances in the cricoarytenoid articulation improved, or in a few particularly favorable cases entirely gave way to a return to normal conditions.

He is further able to state that the cure or improvement in quite a number of these cases has remained a lasting one, as he has been able to convince himself by examination a long time after the end of the treatment. Surely these are pleasing results. On the other hand, as already stated, he has not entirely escaped disappointment. In the majority of his cases, however, in which the method was strictly enough and long enough persevered with, the results have been distinctly encouraging.

The author, however, wishes particularly to warn against being too easily discouraged by apparent want of success at the commencement of the treatment or by occasional slight relapses. Perseverance is never more required than during the silence-cure of laryngeal tuberculosis.

THE TREATMENT OF LA GRIPPE.

NAMMACK states in the *Medical Record* of December 22, 1906, that in a case of la grippe the patient should be at once put to bed, for although prophylaxis against the attack is theoretical and to a great extent impracticable, prophylaxis against sequels is in the highest degree practical and useful. Those who continue at work and endure exposure not infrequently suffer at a later period of the disease from the most serious results. A fair-sized, single dose of calomel, followed if necessary by a saline draught, will help to eliminate some of the infection, if given at the time of the initial chill. The patient's bed should be warmed, and he should receive, in the bed, a foot-bath of hot mustard water with rubbing of the extremities, and a hot drink. Alcohol will be useful in those accustomed to its use, also in the aged and in the weak. Young, healthy, abstemious patients will not need it at this stage. The diet should be restricted to milk, albumen-water, gruel, and the ordinary fever foods. The use of milk should not be pushed in those who have a heavily coated tongue, for it will only cause indigestion. Concentrated meat broths can be used, unless active diarrhea, or the condition of the kidneys, should be a contra-indication. Acidulated drinks will relieve the thirst in some, and also soothe the stomach and flush the kidneys. Others will be benefited by alkaline fluids, such as

Vichy water, or by bland waters. Cold baths and cold compresses are generally not well borne, and increase the discomfort.

The average patient will expect to swallow drugs, and the atrocious pains sometimes present will suggest the use of analgesic antipyretics. It is the conviction of the author that drugs of this class contributed more to the death-rate during 1889-1890 than did Pfeiffer's bacillus. At the present time their use is not so general, but they still occupy too prominent a place in the lay mind. Pain which is severe enough to require drugging will be better managed by Dover's powder or codeine. Another drug largely used by self-prescribers in this affection is quinine. There is not the slightest evidence that quinine in any dose favorably modifies the course of the attack, or shortens its duration, although it may be useful during convalescence. The rule that "the physician is to be a watchman all the time and a therapeutist only when occasion arises" applies with striking force to influenza, yet the symptoms of this affection cry aloud for relief, and of these symptoms the depression and the respiratory catarrh will in most cases be prominent. It is the author's method usually to meet these symptomatic indications by a prescription containing five grains of ammonium carbonate, five grains of ammonium salicylate, and half an ounce of the aromatic wine of erythroxylon coca (of the National Formulary) in each dose. This may seem like active therapy, but this combination has done him yeoman service during many years in private practice, and in dispensary and hospital services. It will relieve headache and neuralgia and stimulate the heart, respiration, and kidneys. Incidentally, the author remarks that it is sometimes fearfully and wonderfully made by apothecaries who are pressed for time. When this combination fails to meet the indications mentioned, the case is serious enough to require constant attention, and the hypodermic use of strychnine, caffeine, or camphor.

The stage of convalescence must be carefully managed by tonic and supporting treatment, especially addressed to the nervous system, in order to avoid the formidable array of complications and sequels, any of which may develop even in mild cases.

The most common complication is bronchitis. This will require its usual treatment, with the important reservation that no remedy should be employed which is a sedative to the nervous or circulatory system. This reservation excludes antimony, aconite, veratrum viride, potassium salts, and large doses of ipecac, and compels us to fall back upon steam inhalations, hot drinks, counter-irritation, rest in bed, and codeine for excessive cough. Should bronchopneumonia develop, strychnine and aromatic spirits of ammonia, well diluted with water, are indicated. Oxygen inhalations, though much derided, are advantageous in some cases. The presence of profuse bronchial secretion in the smaller tubes positively contraindicates morphine.

The poison of influenza is capable of setting up serious changes in the intracardiac ganglia and in the myocardium; therefore the pulse and the heart sounds must be carefully studied, and all unnecessary movements on the part of the patient absolutely prohibited until the rhythm and force of the heart have been restored. The three tinctures, nux vomica, belladonna, and digitalis, act well in bringing about this result, or a similar combination of strophanthus, cactus grandiflorus, and belladonna sometimes acts efficiently. The coexistence of valvular disease of the heart will add its own specific indication for treatment.

Kidney impairment will also supply a field for therapeutic intervention, which is too wide to be gone over within the limits of this paper. Symptoms referable to the nervous system may dominate the clinical picture from the onset, or may become prominent at any time during its course. It is no uncommon sequel to see robust, self-reliant men converted into feeble, hypochondriacal valetudinarians by an attack of grippe, which has weakened the general nervous mechanism, as well as the special nervous apparatus of the heart. This sequence of events seems especially liable

to happen to scholars and brain workers, who should receive the benefit of a long period of rest with entire change of scene and employment before taking up again their life-work.

A CLINICAL STUDY OF 210 CASES OF ACUTE ARTICULAR RHEUMATISM.

PHILLIPS in the *Cleveland Medical Journal* for December, 1906, gives the following treatment for acute articular rheumatism:

The patient, clothed in a flannel night-gown, should be kept at rest in a comfortable bed and should lie preferably between blankets. Abundant drinking of water is necessary to favor elimination and to make up for the fluid lost through free perspiration. Instead of plain water, cream of tartar water may be substituted. The bowels should be opened freely by the administration of calomel followed by a saline, and afterward kept moving regularly by cascara. Where the perspiration is free, the patient can be made comfortable by sponging his body with water to which sodium bicarbonate has been added. The diet at first should consist of milk, although if the latter is not well borne there is no objection to giving soups, animal broths, rice, or tapioca.

Because of the great tendency to anemia, the patient should be placed on a liberal diet as soon as the temperature is normal.

Much has been claimed for the alkaline treatment of rheumatism, that it shortens the course, and that it prevents the development of endocarditis by depressing the circulation. Though the alkalies may be useful adjuncts to treatment, no drugs give such marked beneficial results as the salicylates; indeed, we have come to look upon them as a specific for this disease. The best form is the sodium salicylate from the true oil of wintergreen itself, but aspirin or salicin may be tried. The hospital routine is to give 20 grains of the sodium salicylate every hour until the patient is toxic, the total amount not to exceed 200 grains. If the patient is then not toxic and the disease has not yielded to treatment, he continues giving the salicylate, watching closely the effect of each dose, until in some cases as much as 300 grains have been taken. There is less likelihood of disturbance of the stomach if the salicylates are given well diluted, and in combination with sodium bicarbonate. It is gratifying indeed to see the remarkable transformation in the patient. Patients admitted in the afternoon with a temperature of 103° and joints so painful that they scream with pain if the bed is touched, next morning have a normal temperature and move their joints freely, the pain, tenderness, and swelling having all disappeared. Often cases which have been treated outside the hospital with small doses of salicylates without benefit, have rapidly cleared up when the drug was pushed to its toxic limit. Seldom is the stomach disturbed. The toxic symptoms noted are ringing in the ears and deafness.

Local treatment of the joints is of secondary importance, though it is very comforting in the acute stage. Oil of wintergreen should be painted on the joints, and they should be wrapped in thick cotton wadding. Great relief is sometimes given by the application of hot stupes of lead and opium, or by the application of menthol and oil of wintergreen ointment.

After the acute symptoms have subsided the local applications are discontinued, and 15 to 20 grains of sodium salicylate is given three times a day. To ward off anemia, iron should be prescribed early. The patient should be kept in the recumbent posture for three weeks to avoid cardiac complications. This is especially difficult with the salicylate treatment, as the patient feels so well in two or three days that he often demands to be allowed up.

In acute endocarditis and pericarditis an ice-bag should be applied to the chest. The damage to the valves in the former complication may be lessened by prolonged rest in bed and by the use of small doses of potassium iodide in the late stage. If the effusion in pericarditis becomes large, paracentesis is indicated. The use of blis-

ters over the sternum hastens the absorption of the effusion.

In children, especially, subsequent attacks may be prevented by giving sodium salicylate in small doses for one week out of each month, continuing this for at least a year. If the child has endocarditis with enlarged heart, a prolonged stay of at least six months in bed is advisable. Plenty of fresh air is needed, and the patient should be kept amused with his toys and books, care being taken to avoid excitement. One year ago a child six years old was admitted to the hospital suffering from rheumatism, with chorea, subcutaneous fibroid nodules, and an enlarged heart, the left border of which reached nearly to the anterior axillary line. He was kept in bed six months and treated as outlined above. At the end of that time the chorea was well, the subcutaneous fibroid nodules had disappeared, and the left border of his heart was just outside of the mammary line.

NEWER IDEAS OF THE TREATMENT OF BRIGHT'S DISEASE.

In the *Cleveland Medical Journal* for December, 1906, CROFTAN says that the treatment of Bright's disease must concern itself with counteracting, so far as that is possible, the formation of various groups of toxic bodies. This can be done by paying strict attention to the diet and by promoting intestinal antisepsis by various means, the details of which cannot be discussed in this brief abstract. The best remedies for the latter purpose the author has found to be the bile acid salts and the sulphocarbolate of zinc. That intestinal putrefaction is being held in check can be determined by the reduction or disappearance of the aromatic sulphates (with indican as their chief representative) from the urine, also by the disappearance of the conjugate glycuronates and the compound glycocolls. Bismuth subnitrate when given by mouth, together with intestinal antiseptics, moreover, should not color the stools black if intestinal putrefaction is being held in check.

The treatment of the small group of cases of Bright's disease that is not due to intestinal derangement but to metabolic perversions of an obscure type, usually occurring in young subjects, is much more difficult because nothing very tangible, in the obscurity of our present knowledge, presents itself for treatment.

In this group of cases one is limited in one's endeavors to purely symptomatic treatment. The latter, however, does not consist in the treatment of the renal complications alone, but more generally in the treatment of the cardiovascular signs; and to be successful in the treatment of Bright's disease the renal idea should be largely relegated to the background and attention bestowed upon keeping down the blood-pressure and regulating the action of the heart. A case of Bright's disease should, broadly speaking, be treated as a heart case and not as a kidney case; for most sufferers from this disease die not from the nephritis but from failure of the heart and from the complications that are engendered thereby, and that differ in no material respect from the secondary signs seen in any case of failing cardiac compensation.

The measures at our disposal for regulating the blood-pressure are dietetic, hydrotherapeutic, and medicinal. The diet should be selected in such a way that no preformed pressor principles are ingested, and the minimum of food is eaten that leads to the formation of such bodies; chief among these articles are nuclein-containing foods and foods containing extractives, for the latter incorporate the purin bodies and the former lead to the formation of these purin bodies in process of intracellular dissimilation. Alcoholic beverages of all kinds should be eschewed. Tea and coffee and cocoa are also bad. Smoking is always detrimental.

Hydrotherapeutic measures are of signal value, especially the simple warm bath every evening. The details of these measures cannot be described within the narrow frame of this abstract.

Of medicines the best of all are the nitrites and preparations of nitroglycerin.

They are rarely needed, however, if sensible hydrotherapy is instituted; and it is best to keep medicines in reserve for emergencies in this as in any other chronic disorder. The use of very small doses of digitalis—*i.e.*, of one or two drops of a good tincture throughout the course of the disorder, or at least for many months at a time—is of great value, inasmuch as the drug given in this way seems to regulate the heart's action, and to protect it, one might imagine, from the abnormal stimulating effect of circulating toxins. The administration of such small doses even for long periods of time, in the experience of the author, does not deprive the heart of a vigorous digitalis stimulation should it become necessary to use large doses in emergencies later on.

THE TREATMENT OF CHRONIC VALVULAR DISEASE IN CHILDREN.

The *Brooklyn Medical Journal* for December, 1906, contains an article by CORNWALL on this subject. He states that the use of heart stimulant drugs is often a vital part of the treatment of chronic valvular disease in children, but in order to get the best results they should be administered with care and judgment. Some of them are so very effective that it is easy to fall into routinism in their use, giving them in every case of valvular disease in which compensation is lost or weakened, and in more or less the same doses, and rapidly increasing the doses if the desired effect is not speedily obtained. Such injudicious drugging is frequently responsible for failure to produce good results. In giving these drugs to children the following considerations should be borne in mind:

First, they should not be given at all if the recumbent position alone is sufficient to restore the circulatory balance. It is only when compensation is so far lost that the recumbent posture alone will not restore it that they are indicated. If continued after compensation has been gained they may do harm.

Second, they should not be given to restore compensation without at the same time keeping the child absolutely in bed. Although it is true that adults, under certain circumstances, may be given heart stimulants to bring their circulation up to the level while they are allowed to be on their feet, such treatment is never justifiable in the case of children.

Third, they should be given in doses suited as nearly as possible to the capacity of the heart muscle. Because a certain dose of a heart stimulant fails to bring about the desired effect promptly, it does not follow that a larger dose will produce it. Often it happens that a larger dose will produce an injurious instead of a beneficial effect. If the heart is greatly dilated and its muscle correspondingly feeble, large doses of stimulants exhaust it. In bad cases it sometimes pays to try the effect of diminishing the doses of heart stimulants instead of increasing them. The author reports such action followed by good results. In order to get the greatest benefit from the use of heart stimulants when the heart is much dilated, small doses should be given at first, such as the weakened muscle is able to respond to. Later, when the muscle has gained in strength, larger and more effective doses may be given. In bad cases we should be satisfied at first if we can keep the patient's condition from getting worse. If it does not get worse it is probably getting better. In advanced cases of dilatation with much dropsy, visceral congestion, etc., improvement may be very slow. But if we have patience, and do not try to hurry too fast the development of the compensatory hypertrophy, we sometimes get surprising recoveries. If on the other hand we get impatient, and pour in heart stimulants in a frenzied attempt to make the heart do what is beyond its power, we may hasten the child's death.

The particular heart stimulants which should be used in a given case must be determined by the physician according to his experience, but there are a few guiding indications, such as the degree of heart

failure, the extent of dilatation, and the character of the lesion. When there is considerable dilatation digitalis is the classical remedy, but the superiority of this drug over all others in the treatment of dilatation is less striking in the case of children than in the case of adults. The author has found strophanthus as effective or more so in a large proportion of cases. In cases of severity he usually gives both drugs alternately, and has the mother, or nurse, report to him on the condition of the child while taking each. The report more often than not has been that the patient seemed better while taking the strophanthus. Even in mitral incompetency, where digitalis is generally supposed to be preëminently indicated, he has seen strophanthus produce equally good results. In bad cases of dilatation from any cause strophanthus sometimes acts better than digitalis. In the treatment of the various stenoses he thinks there can be little question of its superiority over digitalis. Possibly the explanation why the action of strophanthus is sometimes better than that of digitalis lies in the fact that it exhausts the heart muscle less than does the latter drug. But strophanthus, with all its good qualities, cannot entirely replace digitalis as an agent for the steady training of the heart muscle. In the use of these drugs much depends on the method of administration as well as the reliability of the preparations.

Besides digitalis and strophanthus there is only one other heart stimulant which we are likely to need in the treatment of most cases of lost compensation. This is strychnine. Strychnine can be used in connection with the other two drugs oftentimes with great benefit, and it can be continued after they have been stopped, and even after compensation has been restored, because it does not have the bad effect on the compensated heart that they are apt to have. It is a valuable adjuvant heart stimulant, but cannot be relied on by itself to restore compensation.

Besides the three heart stimulants above mentioned, there are many others which are in good use, but with the exception of aromatic spirits of ammonia and morphine they need not be mentioned here. The others are inferior, and the only excuse we could have for using them would be that we could not get the better ones. The desire to use something different would not be a sufficient excuse. Aromatic spirits of ammonia is valuable as an emergency stimulant, and morphine is sometimes a life-saving drug. When the dyspnea and cough are extreme and the patient is utterly unable to sleep, morphine or codeine is imperatively called for. But it should be remembered that children usually make more fuss with a given amount of discomfort than adults.

SOME OBSERVATIONS ON PYREXIA AND SUBNORMAL TEMPERATURES IN INFANCY AND CHILDHOOD.

NORTHRIDGE writes under this heading in the *Brooklyn Medical Journal* for December, 1906, and gives the following advice:

If the cause of a fever can be ascertained, and that cause be a removable one, it is a pleasant duty to treat the fever.

Thus castor oil and calomel, quinine, and the salicylates do yeoman service where indicated. Aconite and digitalis are also sheet-anchors. Diuretics, diaphoretics, and laxatives are all very useful where indicated. In the experience of the author it is never necessary and would be often dangerous to use the coal-tar products to reduce the temperature in the fevers of infancy. The author merely mentions them to condemn them.

Fever calls for active treatment for the reduction of the temperature when the elevation causes certain symptoms, or when it is so very high that the swift production of such symptoms may be anticipated. These symptoms are principally drowsiness, delirium, convulsions, rapid and weak heart action, restlessness, and sleeplessness.

Per contra, if the child is calm, smiling, and restful, too active interference is unnecessary.

Hyperpyrexia should always be combated, as the body rapidly wastes when it is present.

As to food, nothing need be said save to remark that it is the author's belief that food very often acts injuriously, increasing the fever when given in a solid form, or in an improper form, or in too great quantities, in fever cases. Witness the favorable drop in the temperature often following the use of a laxative, with complete withdrawal of food for a few hours. Fever consumes tissues to be sure; but the repair process must be gone about very carefully and slowly, or we will but burden the exhausted organism and thus increase the fever and exhaustion.

While perspiration is slight, as a rule, in children, the skin is apt to be full of blood and to feel dry and hot. Pungent is the word that best expresses the sensation given on touching such a skin. In some cases the skin is pale. A bath with friction will send the blood into the skin. The friction is as important as the bath.

The cold friction bath is our best measure for the relief of fever in the cases in which it is dangerous because of its height and persistence. Properly given, the temperature in almost every case in which it is used will drop, commonly from two to three degrees and sometimes more, and the patient will fall asleep. Baruch gives the technique as follows: A suitable tub is filled three-quarters full of water at a temperature of 95°. Give the baby ten minims of whisky. Strip off the clothes and place it in the water with its head resting on the left arm of the nurse, while with her right hand she makes gentle but persistent friction all over the child's body. The water is reduced to 85° by adding cold water or ice to the bath.

The duration of the bath should be five minutes for a weak and ten minutes for a strong child. The baby should then be removed from the bath and wrapped up well in a sheet and blanket, and a hot-water bottle put to its feet. Generally the child will lose all nervous symptoms, the face will assume a placid, restful expression, and a quiet sleep follows.

"Prolonged shivering after the bath means that either the bath was too long or the temperature was too low."

"Cyanosis of the face demands cessation of the bath."

"Chattering of the teeth demands cessation of the bath."

Crying should not be heeded.

The reduction of temperature by irrigation is in many cases very effective, and should always be tried faithfully before the cold bath is used.

Positive instructions should always be given that the lower end of the irrigating bag be not placed higher than 1½ feet above the anal opening. The water should be used at a temperature of 95°, and should be encouraged to gush out alongside of the tube whenever the rectum fills by pressing the tube gently to one side.

In this way about a gallon should be used.

Sometimes irrigation given most carefully fails to make any great impression upon the temperature. It is then well to repeat the procedure within three hours. If this does not bring the temperature down materially, irrigation should be abandoned in that particular case and other measures resorted to.

The alcohol and water sponge bath is very efficient in some cases, being all they need. It should always be tried before using the cold bath. It is always grateful to the patient, never frightens, and will quite often reduce the temperature to within safe limits. Like irrigation it is of much more value in some cases than in others as a febrifuge.

CLIMATE IN THE TREATMENT OF TUBERCULOSIS.

The importance of correct appreciation of the problems involved in the advice given patients concerning change of climate for tuberculosis is forcibly set forth by M. A. Rogers, a physician with eleven years' experience in the desert (Arizona) in the

treatment of large numbers of tuberculous patients. He objects to the current statement that climatic treatment is not a necessary, and hardly an important, factor in the cure of tuberculosis, and he regards a stay in an arid climate as of especial importance for those convalescing from acute diseases, at which time they are exceptionally liable to contract tuberculosis. Students who have had an attack of pneumonia, pleurisy, or measles can pursue their studies in the University of Arizona when they might succumb to tuberculosis if they remained at home. Nursing women and debilitated persons generally will benefit greatly by such a change. The climate of Arizona is especially favorable, he states, to the growth and development of children, infant mortality among those of American parentage being almost *nil.*

In reference to the treatment of tuberculosis the statement is made that only patients in the incipient stage recover, although patients in advanced stages may prolong life beyond what would be possible in more favorable localities. The consumptive in an arid climate needs medical care, rest, and nursing as much or more than at home. Treatment in a sanatorium is most favorable, and Rogers emphasizes the importance of the immigrant at least being supplied with money enough to make himself comfortable without work. The proper time to send patients should be considered. To send them to Gallup, in New Mexico, at an altitude of over 6000 feet above the sea, in the dead of winter, when there is probably a foot or two of snow on the ground and the temperature 10° below zero, and to tell them to live out-of-doors, is to invite a fatal termination. What kills them a little quicker, according to Rogers, is to send them to Tucson or Phœnix in June, when the thermometer is registering 110° or 115°, or even higher, in the shade, with instructions to "get a tent and go out in the desert and rough it." He states that the three great advantages of the arid climate are: (1) The dry, invigorating. sterile quality, which acts as a tonic. (2) The fact that the open-air treatment can be carried on without interruption during the entire winter and with comfort to the patient. (3) The almost continuous bright sunshine, which, besides being curative, is conducive to cheerfulness and hopefulness. All forms of tuberculous throat affections, Rogers states, are unsuitable for climatic treatment. He makes a plea for the establishment of a large sanatorium with ample endowment to care for the unfortunate patients who go to Arizona with insufficient means to care for themselves properly.—*Journal of the American Medical Association,* Dec. 15, 1906.

THE TREATMENT OF CHRONIC CONSTIPATION.

The *British Medical Journal* of December 1, 1906, contains an article on this subject by SIBLEY, in which he expresses the belief that the active treatment of constipation may be divided into two classes —external and internal:

I. The external, or what is now called physical, therapeutics is of great importance if permanent good is to be obtained. This treatment should be directed to muscular exercise, both active and passive. The former should be encouraged by way of all forms of bodily movements, especially as in cycling, rowing, and climbing (mountaineering), but also in walking, and all active outdoor games and sports.

If desirable, certain definite movements of the trunk and limbs may be prescribed, with or without the addition of resistance. The latter, or passive exercise, should be by way of massage, possibly general, but especially local to the walls of the abdomen. Abdominal massage should be firmly performed for manipulation of the superficial abdominal muscles and subcutaneous tissues, but very lightly performed over and in the direction of the natural peristalsis of the large intestine—commencing in the right inguinal region upward to the hepatic flexure, then across the transverse colon to the splenic flexure, and downward along

the descending colon to the left inguinal region. A most important point to be remembered in connection with this subject is that in most cases of old-standing constipation the position of the various parts of the colon is entirely changed, and parts, especially of the ascending and transverse colon, may be much out of the normal regions. Massage of the abdomen should always be very carefully performed, and chiefly with the object of improving the condition of the abdominal muscles, rather than for any direct mechanical effect upon the contents of the bowels. In no case should massage or kneading be prescribed with the idea of breaking up fecal accumulation, as in this way grave injury might be done.

In addition to manual massage, great help may be obtained by the use of the vibrator, especially if worked by electricity, as this can be so finely adjusted to meet the individual case. So also "succussion" may in some selected cases be practiced.

Combined with the various forms of massage, electricity in its numerous modern applications is most useful, not only in producing peristalsis during its application, but especially in its after tonic effect on the muscular walls of the intestines, in addition to those of the abdominal parietes.

The aim of the electrical treatment should be threefold: To improve the tone of the innervation to the intestinal walls, to restore tone to the involuntary muscle fiber of the gut, and to strengthen the external abdominal muscles.

The ordinary constant current applied to the different regions of the abdominal wall for a few minutes daily has long been recognized as of great value. To get the full benefit from this in certain selected cases it is desirable to insert one pole into the rectum. More recently the high-frequency currents have become popular, on account of their general tonic effect, in addition to their local action.

II. Internal treatment may be subdivided into three divisions—diet, drugs, and enemata.

A. Diet should be considered the most important, and no case can be satisfactorily treated unless the condition of constipation is considerably improved, if not cured, by the supervision of the foodstuffs. Patients must avoid (1) bodies containing astringents in any form, such as tannin, found in most teas as generally infused, and also in red wines, especially Burgundy; (2) bodies which are deficient in cellulose, such as potatoes, rice, sago, tapioca; (3) milk; and (4) last, but not least, hard water—that is, water containing lime salts; this should be avoided not only for drinking, but also for all cooking purposes.

On the other hand, these patients should consume plenty of bodies containing abundance of (1) cellulose, such as cabbage, spinach, asparagus, carrots, onions, leeks, garlic, rye, oats, and bran, either in bread or biscuits; (2) those containing sugars and aperient salines, such as apples (raw or baked), rhubarb, prunes, figs, treacle (the old-fashioned black molasses), honey, and orange marmalade; (3) some bodies which stimulate the hepatic secretions, as salads; and (4) bodies rich in fats—butter, fat meats, etc.

The quantity of liquids taken should also be regulated. Many subjects troubled with constipation do not take nearly enough fluids in the course of the twenty-four hours, and an extra pint or two of plain water, with a lump of sugar if agreeable, hot or cold according to season of the year or individual taste, should be given, especially as far as possible on an empty stomach, the last thing at night or the first thing in the morning, or both night and morning.

B. Drugs. At the commencement of systematic treatment some medicines are important to make a good start, especially in getting rid of any old-standing accumulation, but the object should be to diminish and in time do away with these altogether as a routine treatment.

In deciding on the question of drugs, the following different therapeutic actions must be taken into consideration, which for practical convenience may be divided as follows:

1. Laxative: such as aloin, aloes, cascara, rhubarb, senna, castor oil.

2. *(a)* Secretion stimulants: salines, such as natural aperient waters (Apenta, Condal, Hunyadi, Rubinat), chloride of ammonium, sulphate of soda, and sulphate of magnesium. *(b)* Hepatic stimulants: aloes, sulphate of soda, colocynth, jalap, rhubarb, podophyllin, ipecacuanha. *(c)* Cholagogue: calomel, blue pill, gray powder.

3. Peristalsis excitants: strychnine and nux vomica.

4. Spasm relievers: belladonna, bromides, valerian, and asafetida.

5. Nerve tonics: zinc valerianate, arsenic, silver nitrate, glycophosphate of soda.

As to a choice in the multitude of drugs, old and new, probably many of the old-fashioned, such as calomel, rhubarb, magnesia, and senna, in various combinations are the most valuable, or rather, perhaps, are the least deleterious; but it is not every patient who will nowadays take a medicine which is not palatable or convenient, and so we have to resort to various tricks of the pharmaceutical trade to obtain the desired result. It is always very important not to allow patients to take the same form of aperient medicine for too long a period, and generally desirable to let them have more than one variety to be taken on alternate days. At the time of prescribing an aperient medicine or pill, it is necessary to add to it some drug which will have a tonic effect on the walls of the digestive apparatus, in addition to the simple aperient action. Valuable drugs of this nature are belladonna or strychnine, which in combination with aloin or extract of aloes, calomel, or cascara, not omitting a little resin as a valuable adjunct, will make a reliable pill. After a time the dose of the aperient drug should be decreased and the quantity of the tonic one increased. A very successful method in many cases of chronic constipation, especially in anemic subjects, both young and old, is to prescribe a pill containing the dried sulphate of iron, with aloin, and possibly at first a small quantity of extract of aloes, two or three times a day after food. In the course of a few days the quantity of iron should be increased and of the aloes decreased, until a pill containing iron alone is found to be sufficient, and this should be continued for a long period, modified from time to time, according to circumstances. It is often better to commence by giving a milder aperient pill night and morning rather than a stronger one at night only, and from time to time to order a saline, or one of the natural aperient waters, to be taken the first thing in the morning. Saline waters in some instances will be sufficient by themselves, but in very obstinate cases they often only produce discomfort with watery evacuations, leaving large quantities of solid material behind. Of the natural aperient waters, those with a preponderance of salts of the sulphate of soda over magnesia are probably the best to prescribe in most cases, as being less irritating to the mucous membrane.

C. Enemata. Great assistance, especially in removing recent or even old-standing accumulations in the large intestine, can be obtained by the judicious administration of an enema. In some cases injection of warm water and soap-suds acts well; if necessary, the addition of olive or castor oil or turpentine will greatly assist the result.

It is, especially in old-standing cases of constipation with accumulations, most important that the enemata be given with the patient in the knee-elbow position, or if on the back with the buttocks well elevated on pillows, and the foot of the bed raised on blocks. In some cases it may be desirable to shift the position of the patient to one side or the other, according to the part of the bowel it is necessary to get the fluid to flow into by gravitation. By carefully regulating the position and elevation of the patient, it is often possible to inject large quantities of water high up as far as the cecum. In some cases a long, soft tube may be found advantageous over a short one, but this requires considerable skill in passing up satisfactorily.

The temperature of the fluid injected

should be as nearly as possible the same temperature as the body if we wish it to be retained for any time, and should be injected by a continuous stream from a suspended irrigator, and not in an interrupted one forced in by a bell-pump syringe.

If cases of old-standing, hard, dry, fecal accumulation are being dealt with, much assistance will be obtained by injecting a few ounces of olive oil, and leaving this in for some hours before the bowel is washed out; by this means the hard, dry masses will be softened.

If it is only necessary to excite the rectum, injection of a drachm or two of glycerin or the insertion of a glycerin suppository is very efficacious.

In most cases after giving aperient remedies by the mouth for a few days, and having excited the upper region of the digestive apparatus into more vigorous action, an occasional simple enema greatly assists the treatment in the earlier stages.

In many cases of simple constipation the injection of a drachm or two of olive oil into the rectum at bedtime will produce a satisfactory evacuation the following morning.

THE TREATMENT OF BRONCHIECTASIS.

The Practitioner for December, 1906, contains an article by CHAPLIN on this topic. He says the treatment resolves itself into preventing the undue accumulation of sputa in the lifeless and non-resilient tubes, or if that be impossible of accomplishment, into rendering the contents of the bronchi aseptic. To empty the cavities three methods are usually employed: (1) The method of posture; (2) the agency of drugs; (3) the help of surgery.

Posture.—Ewart has laid great stress on this form of treatment, and has formulated in detail the method of carrying it out. There can be no doubt that bronchiectatic patients derive great benefit from it, and in all cases it should be put in practice. The main points in the method may be briefly summarized. The foot of the bed should be raised on blocks six inches high, and not more than one pillow should be allowed. The patient should be encouraged to lean over the side of the bed in the morning, and while in that position make an attempt to expel the contents of the tubes. In children, the plan of lifting them up by the feet, and somewhat roughly percussing the back, is often productive of good results. Respiratory exercises of a forced nature should also be practiced.

Drugs.—Emetics have found a place in the attempts to empty the tubes, but it is evident that this method cannot be constantly employed. Stimulating expectorants are generally given, but it must be confessed that they exert but little influence upon the case.

In the past cases of bronchiectasis frequently came into the hands of the surgeon, but the experience of such operations for opening the cavities and draining them has shown conclusively that but little good, and often much harm, has attended the practice. Now that it is generally recognized that, in the majority of cases, the dilatations are multiple, but few operations are performed. The surgeon rarely has difficulty in opening a bronchial dilatation and draining it, but of what value is that when, in all probability, many others remain unopened? In a series of cases quoted, more than one died as the result of operation performed, when no grave symptoms were pressing.

Surgical operation has little or no effect upon the fetor, and there are dangers to be encountered during its performance, such as hemorrhages and septic infection of the pleural cavity, which should give pause before lightly undertaking the project. Indeed, it may be asserted that cases in which the bronchiectases are multiple—*i.e.*, the chronic form—should never be operated on, however bad the condition may be. In the more acute type the conditions are somewhat different, and so long as the disease, as shown by physical examination, is limited the operation may be

tried in suitable cases, since here, as a matter of experience, the bronchiectasis is often single, or if double, is at least localized.

Methods of Rendering the Contents of the Cavities Aseptic.—To this end drugs have been administered by way of mouth, but with no appreciable result. There is, however, one exception in the treatment of the fetor by garlic, as advocated by the late Dr. Poore. By this method the fetor can be certainly changed, but it is doubtful if the contents of the cavities are rendered aseptic for any length of time. Inhalations of thymol, eucalyptus, and other similar essential oils are also prescribed, but with no lasting benefit.

Intratracheal injections, advocated by Grainger Stewart, have been employed, and with very good results. The only objection to their use is the manual dexterity required in the operation. The fetor can certainly be removed, but one may reasonably ask if the lowest bronchiectases can be reached by this method, and if the small quantity introduced is sufficient to render aseptic the whole of the bronchial tract.

The Inhalation of Creosote Vapor.—Eleven years ago the writer advocated the use of the vapor of the commercial coal-tar creosote in the treatment of bronchiectasis. He was led to try this method on account of its being brought to his notice that a patient in the hospital, suffering from the complaint, had expressed his intention to try to obtain work again at some large creosote works, since he had felt much better when working there some time previously. A visit was paid to the works in question, and some of the creosote obtained. Several patients were placed under the treatment, and after the details were worked out the excellent results from the use of this method were soon manifested. Patients who had been in despair, after trying all manner of remedies, rapidly improved. Since then this treatment has been extensively used by the writer and other physicians, and the result has been to establish it as one which is perfectly safe, and one which offers considerable prospects of success. In using this method it must be remembered that it is of the utmost importance to carry it out in detail, and to persevere with it until the patient has become accustomed to the somewhat trying conditions. Too often it has been abandoned before it had a fair chance of doing good.

But the fact remains that in the large majority of cases in which the creosote inhalations have been fairly tried benefit has resulted, beyond that accruing from other methods, and frequently lasting good has taken place, and in a few cases permanent cure of the fetor. In undertaking this treatment the natural objection of the patient to submit to a method which is irritating must be gradually overcome. Until the patient has had a daily sitting, lasting for from half an hour to one hour, for a week or two, improvement to any extent must not be expected.

As the success of this method depends so much on the details, the main points will be given. The room should be small, about seven or eight feet square, and it should be made as air-tight as possible, so as to prevent the undue escape of the vapor. There should, however, be sufficient ventilation to allow some fresh air to gain access to the room. In the center of this room, on a raised stand, a fairly deep enamel dish on a tripod should be placed, and under the dish a spirit lamp with a regulating mechanism. Into the dish about five or six ounces of common commercial coal-tar creosote is poured. Before the patient enters the chamber the spirit lamp should be lighted, and the creosote vapor driven off, until the room is fairly thick with the fumes. Until the patient is accustomed to the fumes the room need not be densely filled with the vapor. If the lamp is regulated there is little fear of the creosote either boiling over or catching fire. The patient's eyes should be protected with a pair of watch-glasses rimmed with a piece of ordinary sticking plaster, and the nostrils should be plugged with pieces of cotton-wool. The sitting at first should last about twenty minutes a day, and be gradually increased until an hour is taken, and the

room is so dense with fumes that it is difficult to distinguish objects. For those who are nervous it is a good plan for the attendant to take the first few sittings in the patient's company, or a pane of glass may be let into the door, so that the patient feels confidence when he sees that the nurse is close at hand and watching. The sittings should be continued for six weeks or three months; after that a biweekly sitting should take place. Such is the method, which at first sight appears to be a drastic and nauseating proceeding, but the writer has never met with a case unable to take the treatment, out of an experience of over a hundred cases.

RESECTION OF THE CECUM WITHOUT PRELIMINARY FALSE ANUS.

Most surgeons perform colostomy before any operations on the colon, but BAKES (*Archiv für klinische Chirurgie,* lxxx, 4) claims that in certain cases it is unnecessary.

If the patient is in bad condition, or if the heart is weak, it is best to do a colostomy; also when it is necessary to operate during an acute attack of pain, or when the colon is found to be very adherent to the surrounding parts. In other cases, even when there is marked obstruction, the resection may be performed at once. Anesthesia should be as light as possible, and the author operates largely under local anesthesia. After resection the ends are closed blind and united laterally. Minute details of the method of anesthesia are given.

PEPTIC ULCER OF JEJUNUM FOLLOWING GASTROENTEROSTOMY FOR PERFORATING GASTRIC ULCER.

LYLE (*New York Medical Journal,* Dec. 22, 1906) notes that the first case of peptic ulcer of the jejunum was reported in 1899 by H. Braun. This followed gastroenterostomy for pyloric stricture. The affection is very apt to affect males in middle and old age. The time elapsing between the first operation and the formation of an ulcer in the jejunum varied between ten days and eight years. In the majority of cases the interval was from two to six months. Clinically the cases can be divided into three groups. In the first there are no premonitory symptoms or very indefinite ones, the patient being suddenly seized with violent abdominal pains and other signs of perforative peritonitis. There were eight cases of this type in the thirty-one cases reported, six ending fatally. In the second form after varying intervals of freedom from pain the patient begins to have symptoms similar to those of previous stomach ulceration. Pains of variable intensity which come on at mealtime or two or three hours after it are generally noted in the stomach area, radiating from the left border of the ribs downward toward the navel. In some cases food aggravates these pains and in others relieves them. In the region of the upper half of the left rectus there can often be made out a painful infiltration of the abdominal wall, sometimes a well-defined tumor. Twenty of the cases belonged to this class. The third form described by Gosset is characterized by the fact that the ulcer adheres to and opens into some other portion of the digestive tract, usually the transverse colon. The history of these cases is that after a lapse of time the patient again shows ulcerous symptoms, and communication is established with the colon. Then appear the typical symptoms of diarrhea, rapid emaciation, and fecal vomiting.

In the first form the diagnosis is practically impossible and the prognosis bad. The treatment consists in prompt operation.

In the second form the physician remembers that the patient has had a gastroenterostomy done, and if the return of stomach symptoms has taken place should think of the possibility of the jejunal ulcer and watch the stools for blood. In the third form the only treatment is operative. In general the causes predisposing to ulcer formation of the stomach and duodenum are the potent factors in the production of a similar lesion of the jejunum. The most important factor is undoubtedly hyperacidity. It is interesting to note that no cases of jejunal ulcer have been reported following gastroenterostomies for carcinoma. The situation of the ulcer at the site of the gastroenterostomy or near it

also points toward increased acidity as the factor, the gastric juice being undiminished in its acidity at this point. An underlying factor is the disturbance of circulation probably brought about by the operation itself or by the abnormal position of the loops forming anastomosis.

Ulcers of the jejunum in their microscopical and macroscopical appearance are identical with those of the stomach and duodenum. They begin as small hemorrhages in the mucous membrane, from which develops a hemorrhagic necrosis. Thorough digestion of this necrotic tissue and loss of substance takes place, which at first affects only the mucous membrane, but later works into the deeper tissues and finally involves all the layers of the intestinal wall. The ulcer is itself round and often has a punched-out appearance. This is common in cases running an acute course. In slower cases the loss of substance in the mucous membrane is greater than in the deeper layers. There is likely to be peripheral inflammatory infiltrate.

The case reported by Lyle was that of a well-developed man twenty-six years old, who had no stomach trouble until after an attack of measles in 1898. He began to suffer from gnawing pains in the abdomen coming on three or four hours after eating, generally in the morning or afternoon, seldom in the evening, and never at night. This pain would last until solid food was taken. The more of this ingested the greater the comfort of the patient. This condition continued without treatment until November, 1904, when he suffered from an attack of influenza. A month later he noted that the pain was not relieved by food, and was sufficiently severe to oblige him to stop work and consult a doctor. With some intermissions of pain he remained in about the same condition until April 5, when an hour and a half after dinner he was seized with violent abdominal pains and vomiting coming on without previous exertion or warning. Diagnosis of appendicitis was made, and he was operated upon about twelve hours after the beginning of his attack. A perforated round ulcer of about the size of a ten-cent piece was found within three-quarters of an inch of the pylorus, but no dilatation of the stomach. After suturing this posterior gastroenterostomy was performed, uniting the most pendulous portion of the stomach posteriorly to the jejunum about five inches below the ligament of Treitz, after which an enteroenterostomy was performed about four inches below the gastroenterostomy. The patient progressed favorably for thirteen hours, when he had a severe hemorrhage. He was infused and was given adrenalin by the mouth. Thereafter recovery was uninterrupted until three weeks later, when he was seized with abdominal pain, with vomiting, which was relieved by washing out the stomach. Improvement throughout was steady and progressive until six months after operation, when there was return of abdominal pain and vomiting, following which the patient noticed black stools, but did not mention the symptom to his physician. His old symptoms then returned, together with repeated tarry stools and recurrent vomiting. Examination of stomach contents demonstrated persistent hyperchlorhydria. This patient was put to bed on an ulcer cure for six weeks.

THE EARLY RECOGNITION OF CANCER OF THE RECTUM AND ITS TREATMENT.

DREW (*Clinical Journal*, Dec. 5, 1906) deplores the fact that cancer of the rectum fails to reach the hands of the surgeon until the classical symptoms of the well-developed and usually incurable disease are present. This he attributes to the fact that cancer of the rectum in its early stages gives rise to practically no pain. Though there may be even in the beginning some slight bleeding with a little tenesmus and distress, these symptoms are customarily attributed to piles. Drew holds that the rectum should always be examined when symptoms develop, and believes that the most thorough medium for this end is the finger, since in the majority of cases the cancer begins within easy reach. For higher lesions he advises the proctoscope, but admits that

such infiltrations are not likely to be discovered until they are well advanced. Even when the bowel is fixed by peripheral infiltration he holds that attempts at removal are not necessarily futile. Before embarking upon any radical operation he considers it necessary to search carefully in order to exclude the presence of secondary deposits, otherwise the patient may be submitted to an extensive surgical procedure which would be quite useless.

These secondary deposits, he states, are particularly common in the pelvic peritoneum. Their presence can only be excluded by performing exploratory laparotomy. This he makes a routine procedure, placing his incision obliquely in the left inguinal region so that it can be utilized for a left inguinal colotomy.

INDUCED LABOR AS A CONSERVATIVE OPERATION FOR CONTRACTED PELVIS.

MORSE (*American Journal of Obstetrics and Diseases of Women and Children*, December, 1906) for the purpose of his paper divides all labors into three general classes: cases in which the natural powers are sufficient; cases in which forceps or version are needed to supplement the natural powers; and cases in which some one of the cutting operations on mother or child is necessary, in which premature labor is induced to avoid the same.

Enumerating the usual methods of treatment for the last series of cases in the order in which they are most frequently attempted, forceps, version, Cæsarian section, symphyseotomy, and craniotomy comprise the list of available operations from which we must choose the one most suitable and applicable in a given case. Forceps and version are the methods most frequently selected by the average practitioner, his ability to apply forceps and do version being the sheet-anchor of treatment in all difficult labors. Disaster, however, follows when great skill and better judgment would have dictated a better plan of action. Symphyseotomy having been tried, has been laid aside as not beneficial. Craniotomy should rarely be performed excepting in case of a dead child. This leaves Cæsarian section as our method of procedure. To-day, following our most advanced ideas and with the best surroundings, the mortality is conservatively estimated at 10 per cent, though Zweifel reports 76 cases and one death, and Reynolds 76 cases and one death. To the dweller in cities, where the best surgical skill is at command, with modern hospitals and nursing, Cæsarian section may be set down as a safe, sound, and legitimate obstetrical operation. These conditions are not within the reach of most women, and to them Cæsarian section means a last, desperate chance. Hence it appears that in those cases in which the natural powers are insufficient owing to disproportion between the size of the child and the birth canal, there remains but one course of action open to the obstetrician when it is desired to deliver a living child—*i.e.*, the induction of labor at such period of viability as will give the child the best chance of living. There are few physicians who could not to-day induce labor in a thoroughly aseptic manner, incurring the least possible risk to the mother. Moreover, modern science has evolved a very thorough system of care for the premature infant.

The induction of labor in case of pelvic contraction, when the object sought is the delivery of a living child, involves a knowledge of the period of gestation, a knowledge of the size, shape, and character of the pelvis, and a knowledge of the size of the fetal head, especially its size relative to that of the pelvic brim. Accepting 280 days as the normal limit of the date of pregnancy, 220 days has been set as the earliest possible time from which a child can survive. The old rule of counting back three months to the date of the last menstruation and adding thereto seven days is probably the best means of determining the date of expected delivery, though quickening, when felt, should not be neglected. Important information may be gotten by the examination of the abdomen, the height of the uterus at various periods of pregnancy, by ascertaining especially the relation of the fundus of

the uterus to the umbilicus. The fact must not be overlooked, however, that in a deformed pelvis there is a tendency toward a condition of pendulous abdomen and likewise a height of the fundus more than usual at the same period of gestation in the normal pelvis.

So long as we can be sure of the viability of the fetus we are warranted in inducing labor whenever we are convinced that further delay would be dangerous. The best pelvimeter, Morse holds, is the hand. By it all the information needed in these cases can be acquired, though such an examination made in nervous women requires an anesthetic. By the same method the size of the child's head may be ascertained. The head, or presenting part, must be engaged in the brim of the pelvis. Therefore a constantly enlarging head must be watched, and by pushing it down into the brim the relation which one bears to the other must be estimated. This should be done regularly and at frequent intervals, the rule being that so soon as any difficulty is experienced in forcing the head down into the cavity no time is to be lost in inducing labor. It may be necessary to use an anesthetic for purposes of determining this point. Morse bases his method of procedure on the fact that the fetal head may be compressed without injury 0.4 inch. If the conjugate is 3½ inches, then labor should be induced between eight and one-quarter to eight and one-half months, primiparæ being allowed to wait until a week before term. When the conjugate is 3.35 inches labor should be induced at from eight to eight and one-half months; if the conjugate is 3.12 inches, labor is to be induced between eight and eight and one-quarter months; if conjugate is 2.95 inches, induce labor at seven and one-half or eight months; when conjugate is 2.75 inches, seven months and three weeks; 2½ to 2.36 inches, at seven months. Below 2.36 inches conjugate, the indication for premature labor does not exist. These rules are for flat or generally contracted pelves.

Morse also states that so far as his own observation extends the best method of inducing labor is by introducing a bougie between the bag of waters and the uterine wall. Labor is not set up quickly. Repeated efforts are required to inaugurate expulsive pains. If not of sufficient force to accomplish the desired end forceps may be employed as soon as sufficient dilatation of the os permits.

The Paris Maternity reports 30 per cent of six-months' infants saved. Statistics show a saving of 63.6 at seven months, and 85.7 at eight months. Morse holds that the results from premature delivery will show a minimum mortality for the mother, and for her child a better chance of life than labor at full term or any one of the emergency operations resorted to when there is a failure of the natural powers.

OZENA—TREATMENT BY NASAL TAMPONADE.

SONDERMANN (*Münchener medicinische Wochenschrift,* December, 1906) considers the first step in the successful treatment of ozena lies in the complete removal of the foul crusts, which not only produce pressure atrophy, but prevent healing medicaments from reaching the mucous surfaces. When these crusts are sprayed or picked away, even at the expense of time and pains, they very quickly form again; indeed, in twenty-four hours they are found to have reached their original size and thickness. Since it is impossible for most patients to consult a physician daily for thorough cleansing it is advisable that some means should be devised by which they may accomplish this end themselves. Irrigation is the method commonly employed. It often fails because of the firm seating of the crusts; moreover, it is not unlikely to cause middle-ear trouble. Sondermann has devised a simple method of accomplishing an apparently thorough cleansing. A condom tied about a tube is passed into the nostril and blown up by the patient himself. When the lower turbinal is atrophied this rubber bag becomes closely applied to the atrophied walls of the nasal passages, projecting backward into the nasal

pharynx. After full inflation the tube is pinched tight and the rubber bag is left in place for five or ten minutes; the air is then allowed to escape and the bag is withdrawn. This has the effect of thoroughly loosening all the crusts, which can be blown out without trouble. The application is repeated twice daily for the first week, after that once daily. By perseverance and frequent repetitions of this treatment Sondermann believes that these cases can be not only greatly relieved but even cured.

BLOODY METHOD OF RAPID DILATATION.

HOLMES (*Surgery, Gynecology, and Obstetrics,* December, 1906) concludes an article on this subject as follows:

Vaginal Cæsarian section is almost indispensable in certain cases of true cervical rigidity. In the absence of complications, expectancy, aided by hysterauxesis, should be precursors of the major operation.

In the presence of grave contributory complications, as eclampsia, heart disease, etc., complicated by cervical rigidity, the operation is indicated.

We do not know when so-called operable carcinomas of the cervix have metastatic involvement of adjacent glands. If the carcinoma, limited to the infravaginal cervix, has glandular metastases, then the radical vaginal Cæsarian section is only a temporizing measure; at a period not remote, removal of the glands is indicated, after the technique of Ries and Wertheim. Evident encroachment of the cancer into contiguous tissues should be held a contraindication to the radical vaginal procedure.

Rarely will vaginal Cæsarian section be the operation of election in fibroids blocking the pelvis in labor. The abdominal route probably will continue to be the method of choice.

Eclampsia, *per se,* is not an indication for vaginal Cæsarian section. If the cervix is uneffaced, or if it is rigid, then the operation becomes a clinical necessity. Thus far the results, in general, have not been any better by this new procedure than by means of the manual method or Bossi dilators.

Vaginal Cæsarian section is an irrational procedure in placenta previa, and nearly so in ablatio placentæ. A placenta previa with the placental site on the posterior wall, with a rigid os, in the absence of hemorrhage, might be an indication for vaginal Cæsarian section.

The most approved technique includes anterior and posterior incisions, version, immediate removal of the placenta, repair, with tamponade if necessary. Vaginal Cæsarian section demands hospital facilities, if it is to be done rightly.

The dangers of the operation are real, and comprise injuries to the bladder, tearing of the uterus, and hemorrhage both from the incision and from uterine atony. Probably time will prove that dystocia in subsequent labors is directly due to cicatricial contractions of the scar, or that rupture of the uterus is a sequential accident.

PRESENT VIEWS ON DISEASES OF THE JOINTS.

MARSH (*British Medical Journal,* Dec. 8, 1906), after calling attention to the fact that the first step toward a proper understanding of the large majority of diseases of the joints is the regarding of synovial membranes as parts of the vascular connective tissue, devotes himself particularly to a consideration of that group of joint affections in which serious oversights and mistakes are made mainly because though the infection is produced by such every-day agents as the streptococcus, staphylococcus, and gonococcus, their symptoms differ so widely with those which we are in the habit of associating with these several infections that the connection is apt to remain undetected. He holds that gonococcal arthritis when it occurs secondary to a long-lasting case of gleet may come on in precisely the insidious, slowly progressive way characteristic of tuberculous infection. He calls attention to the fact that joint trouble may originate from a septic process in any part of the body, particularly noting the close connection existing between acute rheumatism and septic conditions of the fauces. He reports a case in which a man suffering

from what is called acute rheumatism of the knee, characterized by synovial effusion, great pain and infiltration of the surrounding structure, together with heat, tenderness, and pitting, very promptly recovered by the clearing out of two suppurating tooth roots, although the joint remained stiff with adherent patella.

Marsh notes that he has seen two cases in which carious teeth were cut down level with the gum and a new crown was applied, in which the patients became subject to what was regarded as acute osteoarthritis involving several of the large joints, and those also of the hands. On removal of necrosed fangs and the evacuation of a small amount of pus from the sockets the joint affection was arrested.

Marsh reports a third case of apparent typical rapidly progressing gonorrheal arthritis completely and promptly cured by the removal of a carious tooth root. Reference is made to cases of septic arthritis in cases with septic cavities in the lungs; lesions of the skin, catarrhal inflammation of the genito-urinary tract, particularly after parturition, are quoted by Marsh, who states that when this infective arthritis occurs it takes the form of plastic inflammation attended by the development of adhesions leading to a varying degree of fibrous ankylosis. The synovial effusion is mostly limited, amounting to not more than three or four ounces, and is often absent. Synovial tissue and the periarticular tissues are infiltrated, considerably thickened, firm, inelastic, and brawny, so that the joint is enlarged from uniform swelling. When the knee is affected, thickening may extend to the periosteum and adjacent structures, investing the lower end of the femur, and the bone may feel enlarged for four or five inches above the condyles. The skin covering the joint, in severe cases, is dusky-red, or may be unaltered. Pain may be severe or slight. Muscular fixation and atrophy are usually marked. Suppuration practically never occurs, although the local and general symptoms sometimes simulate it. Firm and complete fibrous ankylosis is the result to be expected in acute cases.

In treatment every effort should be made to find out the source of infection. It should be remembered that a very limited amount of septic material may produce infection which should be treated. The other sources of infection, such as the intestinal canal, must be suspected, and corrective measures adopted. After the source of infection has been taken care of treatment will have for its end the removal of the coagulable lymph, separation of adhesions, restoration of movement, and the repair of atrophied muscles. These ends are best attained by hot douching, massage, and manipulation under an anesthetic. Douching should be employed morning and evening at the highest temperature that can be borne without discomfort. When the joint is cool and painless manipulation should be the first step. If it is evident under an anesthetic that the joint is so fixed that it will not yield to considerable force, hope of restoring movement must be abandoned. Though it may be possible to tear the cicatrix across and so produce movement at the time, a cicatrix will invariably reform, probably over a wider area than before, and stiffness will return; the damage done will be followed by a period of much suffering lasting several weeks, and by thickening and brawny swelling extending over many months.

These adhesions may, however, be broken if no ankylosis occurs in a faulty position, though excision, particularly in the knee-joint, is usually a better operation. When the adhesions readily give way under manipulation, the manipulation should be repeated about once every two weeks.

TECHNIQUE OF LOCAL ANESTHESIA IN RECTAL SURGERY.

TUTTLE (quoted in *Boston Medical and Surgical Journal*, Dec. 20, 1906) has employed this technique in upward of four hundred cases. The lesser sphincterian nerve of Morestin and the inferior hemorrhoidal nerve are reached by a single puncture of the hypodermic needle back of the anal commissure, and the introduction of 20

to 30 minims of one-half per cent eucaine or cocaine so that the sphincter can be thoroughly stretched. After this is done the hemorrhoids, or other conditions for the relief of which operation is proposed, are further anesthetized by the local injection of small quantities of 1/10-per-cent solution of eucaine, cocaine, or other anesthetic. Sometimes it is necessary in very sensitive patients to anesthetize the branch of the pudic nerve which supplies the sphincter at the anterior commissure by the introduction of a small quantity of solution at this point.

VACCINE THERAPY AND PASSIVE HYPEREMIA IN SURGERY.

HOLLISTER (*Surgery, Gynecology, and Obstetrics,* December, 1906) states that in order to secure the best results in general surgical work to-day one must combine (1) the most approved methods of surgical technique with (2) vaccine therapy, such as has been of late made practical by the work of A. E. Wright, of London, and (3) the working methods of hyperemia, as have been so strongly advocated by Bier, of Bonn, and many others. In other words, in order to do the most good in the shortest time for the patient, the general surgeon must use one, or a combination of two or all, of these different lines of treatment, depending upon the nature and stage of the affection.

Wright has developed to a definite practical working basis the use of "vaccines" for tubercular, staphylococcic, and streptococcic (and we shall probably soon be able to say gonococcic) infections. He has developed a clean-cut laboratory technique whereby one can in most cases not only diagnose the individual infection, but can accurately judge the effect on the patient of the vaccine given from dose to dose. By so doing he has been able to accomplish results of which we have all read and heard.

A favorable outlook has been earned in this opsonic work by experiments. The results reported by Bier and many others throughout Germany, especially at the surgical congress in Berlin last spring, from the use of active and passive hyperemia, especially in the so-called surgical infections, are good.

Hollister's results in a number of selected cases treated by passive hyperemia have been as a rule excellent.

With one exception the patients have considered themselves improving. In this one the general condition was critical in the extreme, because of a mixed infection when the inoculations were begun, as shown by the marked emaciation, decubitus, high temperature, discharging fistulæ, etc.

In no case has there occurred evidence of further advancement of the infection.

In one case a fistulous tract, open for months, closed for the first time, and remained closed for about three weeks to date.

In a case of arthrectomy for tuberculosis of the elbow-joint, with persistent fistulæ, rapid increase in power to use the right arm is noted.

The value and necessity of the vaccine therapy to the work of the general surgeon is assured, because:

1. We can diagnose the specific infection by observations of the opsonic index, and this without administration of any vaccine whatever.

2. We can raise and maintain this opsonic index to a point as high as or higher than that of the normal individual by the properly sized and properly interspaced doses of the specific vaccine.

3. When we do so raise and maintain it, we add to the resisting power of the patient's serum, and hence the tendency of the patient is toward recovery.

SPRAINS AND THEIR SIGNIFICANCE.

BENNETT (*British Medical Journal,* Dec. 8, 1906) observes that it is probable that neglect or indifferent treatment of some of the minor injuries results in more disability amongst the community generally than would arise from a considerable percentage of the cases which are thought to require operation. It has been conclusively shown

by the *x*-ray that a large proportion of injuries commonly called sprains are in reality complicated by slight fracture, the latter, however, being of subordinate importance in the pathological sense because the sprain of the soft parts is the predominant feature.

Bennett's classification of sprains is as follows:

1. Simple sprains involving the soft parts only.

2. Sprains with fracture, giving symptoms so slight as to make diagnosis under ordinary conditions impossible.

3. Finally, gross nerve injury.

The first essential in treatment is to determine whether fracture coexists. This can be determined only by the use of the *x*-ray. It should be an accepted practice that, when possible, every sprain, especially those near joints, should be examined in this way. On general principles when the *x*-ray cannot be procured it is safe to regard every sprain near the joint in which the symptoms are unduly exaggerated as being complicated by fracture, especially if the parts concerned be the phalanges or the metacarpal region. Crepitus is of little value in making the diagnosis of these fractures, since it is often absent when fracture is present, or may be present from involvement of the joint, even in the absence of fracture.

After deciding as to the presence of absence of fracture, the next point is to look for evidences of gross nerve lesion. The distal part should be examined for numbness, which may be due to nerve shock, in which case it disappears in a few hours. If, however, it persists for more than twelve hours a gross lesion of the nerve branch is fairly certain.

Simple sprains—*i.e.*, those not complicated by fracture or nerve lesions—may be classified as those with swelling and those without, the latter constituting a very small minority, practically limited to the sprains about joints amongst the deep muscles, as in the back and neck. In sprains without swelling the main and important indication is the relief of pain, which is often intense. Absolute rest with very firm compression is usually effectual in this respect. The best way of applying pressure is by strapping. The strapping should be applied with due consideration for its purpose—*i.e.*, firm support of the part and at least a partial splinting. Early massage is indicated in all these simple cases without swelling. Passive movements should follow later, at perhaps the end of a week. Voluntary movements on the part of the patient should be begun early and are often a source of relief. When this sprain is accompanied by immediate swelling, which, of course, must be due to blood effusion, cold is of no particular service and in debilitated persons may sometimes lead to extensive sloughing. This is particularly the case in patients suffering from advanced renal degeneration. Hot fomentations usually serve a better purpose and are safer. Pressure is also not thought of under such circumstances by Bennett, who simply employs absolute rest. When the immediate swelling has ceased to increase a firm bandage is applied to the part, followed by massage. This bandage is not of impermeable rubber. In case skilled massage cannot be procured strapping is the best alternative, the frequency of its renewal being determined by the diminution of the swelling. For the prevention of adhesions and muscle wasting the voluntary movements, massage, and passive movements are serviceable. Slight voluntary movements should be begun at once, the patient being instructed to many times a day attempt to move his joint as freely as possible without producing pain. Massage should not be delayed for more than twenty-four to thirty-six hours after the cessation of the increase of the local swelling. Passive movements should be delayed if immediately following them there is a marked increase in the heat and tension of the part.

When an interval has occurred between the infliction of the injury and the full development of swelling—*i.e.*, when the latter is due to an inflammatory effusion—treatment depends upon the absence or presence of heat, and in the case of joints

upon the amount of tension. In the absence of local heat free massage and manipulation are indicated, combined with firm elastic pressure. In effusion without heat, occurring in joints two weeks or more after the accident, the possibility of syphilis or gout as contributing factors must not be overlooked. Iodides in some form internally are often helpful, especially if combined with free inunction of petrolatum locally.

Free incision and cleaning out of the well-marked hematoma greatly hastens recovery from a sprain. Tension within the joint after sprain, which may come on either immediately or after some days, is always associated with local heat and also great pain. When absolute rest and hot fomentations fail to relieve the pain aspiration is indicated, enough of the fluid being drawn off to make the patient comfortable.

In the treatment of sprains with fractures massage as a rule should be commenced at once; rest for the part in splints must be maintained for a long enough period to enable the detached bone to reunite sufficiently to retain its position during voluntary movements. Early movements are essential to quick recovery; these must be passive and not voluntary as in simple sprain.

Sprains with gross nerve injury are most important because of the difficulty in treatment and their resulting in imperfect cure, though the defective recovery is not generally attributed to its real cause. Many of the imperfect results are due to indifferent diagnosis, the nerve lesion having escaped notice in consequence of its slight symptoms. When the evidence of nerve lesion is pain along the line of the distribution of the nerve rest only will bring about a complete and permanent cure. This must be continued until all symptoms of nerve pain have passed away. From this comes the difficulty in treatment, since the patients can rarely realize the importance of prolonged rest. Massage does harm in the early stages of this type of case, but later combined with electricity may be most serviceable.

In cases in which numbness is an indication of nerve lesion treatment is quite different, and if the symptoms have not disappeared in twenty-four hours the only hope of cure lies in skilful use of massage, supplemented after two or three days by galvanism, with flying blisters over the seat of the lesion.

The late consequences of sprain are classified as preventable and unavoidable in certain cases. Among the preventable late consequences are persistent pain, stiff joints, wasting of muscles, general relaxation of joints, and deformity. Under the unavoidable consequences of sprain are osteoarthritis, local paresis, and myositis ossificans. The persistent pain is held to be usually due to excessive immobilization in ordinary cases causing adhesions. Stiff joints are attributed to the prolonged use of splints or the delay in the commencement of voluntary and passive movements. Such stiffness can usually be avoided even when splints are required for a long time by the removal of the appliances for at least an hour a day, during which the patient is encouraged to move the part as much as the pain will allow. Passive movements are practiced depending upon the conditions. Excessive relaxation of the joint is occasionally noted, due to wasting of the muscles. This is remedied by early massage and active and passive movements. The late deformity of sprain is in the adult always the result of an undetected fracture. In growing people it may arise from injury to the epiphysis.

Osteoarthritis is very often traced to a joint injury which even though slight is followed by effusion. The author holds that excessive immobilization is responsible for the development of this condition.

THUMB REPLACED BY A GREAT TOE.

A man who had lost his right thumb while a child was treated by KRAUSE (*Presse Médicale,* No. 93, 1906) in a novel manner.

He first cut the skin of the stump and freed the dorsal tendons. Then cut the skin and tendons of the dorsal surface of

the great toe of the same side and resected the end of the metatarsal, so that the first phalanx could be applied to the end of the metacarpal of the thumb. The dorsal tendons and skin of the thumb were then sutured to those of the toe. A dressing was applied to hold them in position and was left seventeen days. The operation was then completed by section of the ligaments and palmar tendons and skin and the suture of the corresponding parts. The result was excellent and the new joint was freely movable, but further exercises will be required to make it strong enough to be useful.

HEART MASSAGE AS A MEANS OF RESTORATION IN CASES OF APPARENT SUDDEN DEATH.

GREEN (*Lancet*, Dec. 22, 1906) notes that massage of the heart as a practical means of treatment in cases of sudden failure of the pulse and respiration, especially when such an accident follows the induction of chloroform anesthesia, is based on Schiff's laboratory experience with dogs, he having been able to prove that if the thorax is opened and at the same time air is insufflated into the lungs, by rhythmical compression of the heart with the hand and continuous pressure of the abdominal aorta so as to bring the blood in greater quantity toward the head, it is possible to reëstablish the heart-beat even up to the period of eleven and a half minutes after the stoppage of that organ.

Tuffier and Hallion later communicated a similar series of experiments along with notes of a case in man. They were able to restore the heart-beat to animals which had been suspended for a varying time, from one to five minutes.

Prus in 1900 published the results of experiments performed by him on dogs; some dead from chloroform, some asphyxiated, and some electrocuted. Of the dogs which were chloroformed the heart stopped in times varying from fifty seconds to twenty minutes after the commencement of anesthesia. Heart massage and artificial respiration were started in periods varying from fifty-five seconds to one hour after the arrest of the heart. In sixteen cases—*i.e.*, 76 per cent—the results were successful, natural pulsation returning in periods varying from thirty seconds to twenty minutes. All the animals thus restored to life were killed at the end of the experiment save one, which was alive and well eight months later. In this particular case massage was commenced four minutes after arrest of the heart, and pulsation returned after massage had been persisted in for five minutes. Of the forty-four dogs which were asphyxiated, thirty-one recovered, but of the thirty-five which were killed by electricity only five were restored to life.

Batelli showed that in many of the unsuccessful cases massage caused fibrillary twitchings of the heart muscles instead of true contractions. Once these twitchings appear it is almost certain that failure will result. He was, however, successful in overcoming them by an alternating current of 240 volts. He later demonstrated that these fibrillary twitchings developed more frequently in animals that were experimented upon in a fasting state than in those which had had a few hours previously a feed of albuminoids and carbohydrates.

Kuliabko performed a remarkable series of experiments in which he used the hearts of rabbits killed for the purpose. He removed the hearts from the bodies and put them in an ice-chest for forty-four hours. At the end of this time he succeeded in restoring pulsation to them for several hours by injecting Locke's fluid into the coronary arteries. Later, in a similar manner he restored the hearts of rabbits that had died from disease, even three or four days after death; and in August, 1902, he succeeded twenty hours after death in restoring pulsation to the heart of a boy aged three months, who had died from double pneumonia, which pulsation continued for over an hour.

Velich successfully repeated Kuliabko's experiments, and stated that Spina injected into an artery in a direction toward the heart a large quantity of normal saline solu-

tion (200 Cc. in a dog) at from 35° to 40° C.; and by thus doing, along with the practice of artificial respiration, he revived animals in which the brain and cord had been destroyed, or which had been poisoned with alcohol, nicotine, etc., even when ten minutes had elapsed since the heart's action had been arrested.

Bourcart in a series of experiments in dogs used the subdiaphragmatic method for massaging the heart, and also had successful results.

D'Halluin in 1904 and 1905 noted as the result of his experiments that the longer the time which elapses between the stoppage of the heart and the beginning of the massage the greater is the probability of the fibrillary twitchings. For their treatment he finds that the intravenous injection of a solution of chloride of potassium (one-fifth of a grain for every kilogramme of the animal's weight) is the most useful, and considers that it acts first by arresting the heart and so stopping the twitching. Then if massage is immediately commenced the salt solution is distributed through the general mass of blood and dilutes its tonic properties.

After this review of the laboratory experimental evidence Green reports two of his own cases. The first is a case of chloroform death dependent on cardiac arrest. The respirations continued spasmodically for five minutes after all heart sounds had ceased. Twenty-five minutes after the heart had stopped the abdomen was quickly opened through an incision beginning about one inch below and to the left of the tip of the ensiform cartilage, and passing downward and outward along the left costal margin until it was large enough to admit the right hand. This was carried up toward the heart, the diaphragm only intervening between the two. The heart was motionless and flaccid. Rhythmical compression of the organ was begun with the right hand pressing, through the relaxed diaphragm, against its lower and posterior surface, and the left hand outside over the precordial region, the rate of compression being about 70 per minute. This method was continued for about two minutes without appreciable effect. The surgeon then grasped the apex of the heart without any difficulty with his right hand, his thumb being over the right ventricle and his fingers surrounding the left ventricle. Interrupted compressions were continued. There was soon noticed a slight fluttering of the organ, and at the same time the pupils contracted slightly. In a few seconds the heart began to beat forcibly with more than normal vigor at a rate of about 90 to 100 beats per minute. The artificial respirations were continued all the time. In a very short period after the restoration of the pulse spontaneous breathing reasserted itself, and the breathing became regular. The skin and lips resumed their normal appearance, and in twenty minutes from the beginning of the incision the heart and lungs were performing their functions normally. Sensibility, however, never returned. Toward the afternoon the patient developed tonic spasms with rigidity of the muscles of the limbs and trunk, and died twenty hours after the respiration and heart-beat had been reëstablished.

The second case died of syncope in consequence of diphtheria. Artificial respiration was begun at once, and fifteen minutes later the abdomen was opened and the heart was compressed as in the former case. Free passage of air to the lungs was insured by tracheotomy. As there were no results obtained by these measures the pericardium was opened by an incision through this muscle, which was enlarged till it would admit three fingers. Thus the ventricular portion of the heart could be grasped and compressed rhythmically. Slow contractions were noted after five minutes, and after another five minutes the heart began to beat slowly; the ears and lips, which had previously been quite livid, resumed their normal ruddy appearance; and the tracheal and abdominal wounds bled slightly. Half an hour after the restoration of the beats the heart ceased pulsating. Green further reports a case occurring in the practice of Keetley. The patient died under chloroform. The usual methods of restoration

proved futile. At the end of three-quarters of an hour Mr. Keetley opened the abdomen and compressed the heart in the manner already described, but without result.

Green has collected in all 40 cases, 36 of which have been previously reported. Four methods of operation may be utilized to gain access to the heart:

First, the thoracic method. In this a rectangular flap is cut over the left side of the thorax with the base either outward or inward. The two great objections to this method are that the operation is itself a slow and severe one, and in resecting the ribs there is great danger of injuring the pleura and causing a left pneumothorax, an event which would make restoration of the heart-beat and spontaneous breathing much more difficult to accomplish.

Second, the transdiaphragmatic abdominal route. After opening the abdomen an incision is made passing obliquely from right to left and from before backward, starting slightly in front of the summit of the diaphragm and passing toward the apex of the heart, but not involving it. As soon as the diaphragm is penetrated the remainder of the incision is made with scissors on the finger as a guide.

Third, the subdiaphragmatic route. This is the one most frequently adopted. Through the abdominal incision the surgeon has merely to pass his hand up to the under surface of the diaphragm, through which it is usually quite easy to define the heart and press it up against the posterior surface of the thoracic wall, counter-pressure being made at the same time with the other hand on the exterior of the chest. An opening along the left costal margin seems to allow of freest access. This method has given the best results so far with six complete successes.

Fourth, Crile's method consists in making rhythmical pressure on the chest wall over the heart and the use of Fell O'Dwyer's apparatus for producing artificial respiration, aided by intravenous injection of solutions of adrenalin of strengths varying from 1 in 25,000 to 1 in 50,000, such injection continuing at the rate of 3 cubic centimeters per minute if this is necessary. In addition a rubber suit is applied, which produces an even pressure over the whole body. In this way the blood-pressure is mechanically increased.

Out of forty cases nine are reported as being entirely successful and eight as being partially so—that is, cases in which the pulse and respiration were definitely restored, but which ultimately ended fatally.

Green summarizes the results as follows: (1) It has been possible in human beings to restore the heart-beat by massage when ordinary measures of resuscitation have failed, even when the massage has not been commenced until the heart had been stopped for forty-five minutes, but a definite complete cure has never yet been effected when this interval has been longer than from seven to eight minutes. (2) In many of the cases the adoption of massage for a period of from thirty seconds to five minutes has been sufficient to restore the heart-beat, but it has sometimes been necessary to go on with it for fifteen minutes or even longer. (3) Artificial respiration and its adjuncts must also continuously be applied, and sometimes it is necessary to persevere with it long after pulsation is restored in order to reëstablish the respirations. The kinds of cases in which it may be used with a fair prospect of success are: (1) Cases of primary arrest of the heart in a condition of acute dilatation from poisoning by an overdose of a powerful volatile drug, such as chloroform; (2) cases in which the gradual accumulation of volatile poisons, such as chloroform, leads to primary paralysis of the respiratory and vasomotor centers, followed by stoppage of the heart; (3) cases of asphyxia; and (4) cases of suspension of the functions of the vital centers from simple exhaustion or injury, and consequent stoppage of the heart.

It would seem that the order of procedure in these cases of sudden heart and respiratory failure should be as follows: (1) Immediate lowering of the head and the commencement of artificial respiration and tongue traction, taking care that a free access of air to the lungs is possible, and

therefore implying tracheotomy if necessary. (2) If the abdomen is open, pressure on the abdominal aorta to confine the circulation to the upper part of the body. If it is not open the intravenous injection of adrenalin solution and the application of Crile's rubber suit, or, failing this, tight bandaging of the limbs and abdomen. (3) The subcutaneous or intravenous injection of normal saline solution, partly to raise the blood-pressure and partly to dilute any poisons which may be in the blood and tissues. (4) If the above methods have not been successful after being applied for from eight to ten minutes, heart massage by the subdiaphragmatic method. This route should always be adopted, unless the chest is already opened or to be operated upon, as being the easiest way of access, the one fraught with least danger to the patient and the one which has given the greatest percentages of success. The time is fixed at from eight to ten minutes, because eight minutes is the limit of the interval at which up to the present time a complete success has been obtained in man, and if it is exceeded the danger of the production of fibrillary twitchings, inability to restore consciousness, and the development of spasms in the voluntary muscles, with consequent failure of the manipulations, have to be taken into consideration. The unavoidable extension of this limit should, however, be no bar to the adoption of the method, as very hopeful results have been obtained even when forty-five minutes has elapsed from the onset of the syncope before it has been tried. (5) After normal pulsation has returned to the heart, artificial respiration must be continued until spontaneous breathing has been restored, or until circumstances make it improbable that such restoration will be obtained.

TUBERCULOUS PERITONITIS—WHEN TO OPERATE.

The interesting fact is brought out by GELPKE (*Deutsche Zeitschrift für Chirurgie,* lxxxiv, 4, 1906) that only cases of several weeks' standing should be treated by incision. The only cases of less than six weeks' standing which recover after operation are those characterized by extremely large exudate.

Experiments on animals have shown that removal of the exudate soon after inoculation of the peritoneum has a very bad influence on the course of the disease, and the same is true in man except in cases with unusually profuse exudate. A series of tables collected from various authors shows that of 46 cases operated on within two months of the beginning of the abdominal enlargement only five recovered, and in three of these the large amount of exudate is commented on. Of 79 cases operated on four months or more after the beginning of the ascites all recovered except 12, and of these four died from sepsis or hemorrhage, three were cachectic at the time of operation and died soon after from phthisis, and three of the others showed an exudate with very little fluid and a large amount of caseous matter. Of 43 cases of between two and four months' duration 28 recovered and three died from sepsis. These figures show the folly of operating early. Gelpke believes that the exudate has at first strong bactericidal properties and that it gradually loses these. If it is not replaced by fresh exudate after this the condition grows worse, but if it is drawn off the fresh exudate which takes its place has also strong bactericidal properties and continues the work of healing. If it is drawn before its work is done harm results. Free incision gives better results than simple puncture, but the use of antiseptics, even salt solution, and drainage are to be avoided.

CURETTEMENT WITH LOCAL ANESTHESIA.

In an article on the local use of novococaine BLONDEL (*Revue de Thérapeutique,* No. 23, 1906) states that he can perform curettement of the uterus painlessly if the cavity of the womb is packed for ten minutes with gauze saturated with a five-per-cent solution of this substance. This does not abolish the reflex contracture of the wall which follows touching the exposed muscle, and which may be disagreeable although not actually painful.

REVIEWS.

THE MEDICAL AND SURGICAL USES OF ELECTRICITY. By A. D. Rockwell, A.M., M.D. New Edition, Revised and Enlarged. E. B. Treat & Company, New York, 1907. Price $5.00.

For many years Dr. Rockwell has been recognized by the American medical profession as being distinctly the leader among electrotherapeutists, and his large experience and constant employment of this remedial agent for the relief of various disorders make anything that he may write or say concerning this subject of more than ordinary interest. The present volume not only deals with medical electricity, as we used to know it, but with the use of the *x*-ray, phototherapy, the Finsen light, vibratory therapeutics, high-frequency currents, and radioactivity. We are informed in the preface that this is practically the eleventh edition of the work, the book having appeared originally under the names of Beard and Rockwell.

There can be no doubt whatever that all of the measures just named afford the physician therapeutic opportunities in the treatment of disease, but there can also be no doubt that many of those who employ electricity most largely for medical purposes exaggerate its value, and believe that it does good in conditions in which the very nature of the condition practically prohibits advantageous results. In other words, our point is that a comparatively small proportion of cases as seen by the general practitioner require the use of any one of these remedial agents for their relief, and, on the other hand, that when these remedial measures are applicable they must be applied by one who has had very large experience in their technique, and who can afford to be possessed of very expensive apparatus.

Dr. Rockwell's book, as we have already pointed out, is, without doubt, the most authoritative book upon this subject which the medical man can purchase. But there are a number of things in it with which we cannot agree, and the mention of which in the text we think seriously detracts from the scientific value of the rest of the work. In some instances the fault lies apparently in a looseness in the use of terms. For example, on page 303 we are told that galvanization is useful in disorders of the "vasomotor nerve," and therefore is of value in some cases of "deficient circulation, cutaneous hyperesthesia, certain diseases of the skin, and exophthalmic goitre." We know of no one vasomotor nerve, and if it existed it is questionable whether its galvanization could produce changes in cutaneous hyperesthesia or diseases of the skin. Again, on page 338, we are told that the object in central galvanization is not only to influence the whole central nervous system, such as "the brain, sympathetics, and spinal cord," but "the pneumogastric and depressor nerve" as well. The depressor nerve is one which exists in the circulatory mechanism of the rabbit, but so far as we know there is no "depressor nerve" (strictly speaking) in the anatomy of the human being. In the rabbit it is a branch of the vagus, and its function, as is well known, is to lower arterial pressure under certain circumstances when this pressure reaches a point which overburdens the heart.

In regard to any attempt to galvanize the brain, we believe that it is quite impossible to pass electricity through the scalp and the skull into the cerebral cortex unless a current is used which is unsafe, and that any effects which follow the application of galvanization or any form of electricity to the vertex are reflex and not direct. The statement that a current passing from the vertex to the epigastrium "traverses the center of life—if life has any center—and affects the sympathetics and the roots of the facial nerves" is probably incorrect, and so general as to possess little value. Why it

should be considered advisable to galvanize the roots of the facial nerve, the brain, and the sympathetics all at once we do not understand. So, too, we doubt whether it is worth while to state, as on page 487, that photophobia dependent on scrofulous inflammation of the cornea in children can be benefited by one to three applications of galvanic electricity. Again, the employment of galvanic electricity in the convalescence of typhomalarial fever is questionable, the more so as clinicians of the present day do not recognize the existence of any such malady. The use of general faradization and central galvanization in conjunction with quinine and iron in the treatment of acute febrile diseases, as on page 521, seems scarcely rational, and the statement that Dr. Glax treated thirty cases of typhoid fever by galvanization of the cervical sympathetics, thereby "reducing the temperature and diminishing the fever" (*sic*), we think is open to grave doubt. Statements of this character, which are antagonistic to modern conceptions of physiology and pathology, mar the quality of the rest of this excellent book, and we hope they will be corrected in the next edition.

AMERICAN PRACTICE OF SURGERY. Editors: Joseph D. Bryant, M.D., and Albert H. Buck, M.D. Complete in Eight Volumes. Illustrated. Volume II. William Wood & Company, New York, 1907.

The second volume of this Surgery has been looked for with some impatience by those whose appetite for more was whetted by the first volume.

James Farquharson Leys contributes the first chapter, entitled "Diseases which Belong in Varying Degrees to the Domain of Surgery, and which are Observed in Certain Parts of the United States and its Dependencies, and in Canada." Under this caption are included leprosy, plague, glanders, anthrax, actinomycosis, mycetoma, rhinopharyngitis mutilans, and scurvy. In regard to leprosy he holds that it certainly is a contagious and infectious disease and suggests that carriers may be mosquitoes, lice, or fleas. He uses the word contagion simply as a term which implies that an affection is directly or indirectly communicable, and notes that the disease is very feebly or mildly contagious.

Bubonic plague has, the author states, in 1894 caused 60,000 deaths in Canton. It is described as primarily and essentially a disease of rats, frequently communicated to other animals and to man. It is communicable by inoculation, by ingestion of infected food, and by inhalation. There is a period of incubation of from two to eight days. The diagnostic test is the discovery of the bacillus in the lymph nodes, blood, sputum, or discharges. As soon as the diagnosis is made Yersin's serum in the dose of 10 to 20 cubic centimeters should be given.

Discussing glanders, the author holds that mallein has no curative effect. Expectant treatment is rather favored for anthrax.

V. P. Gibney writes upon tuberculosis from a surgical standpoint, stating that the tuberculin test has not proven of great value in his hands.

Edward L. Keyes writes upon syphilis from a surgical standpoint, considering infection, immunity, and heredity. As to prognosis he states that he feels justified in telling all syphilitics who come to him in the early stages of the disease, with fair health and without a history of marked alcoholism, that they probably will suffer from their disease for not more than a year, and that they may expect to hear no more of it thereafter, on condition of abstaining from alcohol and submitting to treatment.

Abscess, ulcer, and ulceration are treated in a brief but practical way by August F. Jonas and William McDowell Mastin.

Alfred C. Wood contributes an admirable and scholarly article upon gangrene and gangrenous diseases.

To Douglass W. Montgomery has been assigned surgery of diseases of the skin. In the treatment of furuncle he prizes the

starch poultice, to which is added a heaping teaspoonful of boric acid powder.

Carbuncle is very briefly considered. Mycetoma is again discussed in this chapter and is stated to be incurable. There is also a repetition of subject-matter in the case of glanders and anthrax, nor does post-mortem pustule seem a happy appellation for an infected wound. Cutaneous horn is given a whole page, and similar space is accorded to granuloma coccidioides, whilst carbuncle is accorded very little more.

J. Clark Stewart contributes a section upon surgical diseases and wounds of muscles, tendons and their sheaths, bursæ, fasciæ, and connective tissue. These subjects are scarcely covered with adequate thoroughness for the practical surgeon.

Willard contributes a most excellent article on surgical diseases of nerves, one which can be criticized adversely only because of its brevity.

Dowd's section upon surgical diseases of the lymphatics accentuates the need of wide dissection in the removal of all malignant growths.

Burns and the effects of electric currents and lightning are treated by Benjamin T. Tilton.

Frost-bite is discussed by Paul Monroe Pilcher.

The subject of wounds is covered by Carl R. Darnall and William C. Borden. The latter has contributed a truly admirable article.

As a whole this second volume scarcely equals the high standard set by its predecessor. It appears to deal with general principles rather than their application. The ground is covered in a manner perhaps acceptable and useful to students, but not satisfactory to the practitioner, who wishes to find in a volume of this character not a general résumé of diagnostic teaching, but the individual preference of the writer of the article and his reasons therefor.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D.

The month's doings include the celebration of the 179th anniversary of the birth of that great pioneer of the scientific study of morbid anatomy, John Hunter, who founded the Museum of the Royal College of Surgeons, which is one of the treasures of London. Mr. H. T. Butlin delivered an oration on the objects of Hunter's life, in the course of which he showed anatomical specimens which had been prepared by Hunter 120 years ago, and were still in excellent preservation. In the evening a dinner was given at the college in Lincoln's Inn Fields, to which a large number of distinguished guests had been invited. The president of the Royal College of Surgeons, Mr. Henry Morris, took the chair, and among those present were Prince Francis of Teck, the Earl of Onslow, Lord Reay, Lord Cheylesmore, Sir Herbert Maxwell, the vice-chancellor of Cambridge University, the principal of London University, the director-general of the medical department of the army, and also of the navy, the president of the Royal College of Physicians, Sir Douglas Powell, and many others well known in various departments of science.

The Royal Commission on Vivisection is proceeding steadily with the examination of witnesses, and assuming that an antivivisectionist is capable of weighing evidence and arriving at a logical conclusion, one might suppose that the antivivisectionist propaganda had already been sufficiently discredited to throw even the energetic secretary of the Antivivisection Society out of employment. Professor

Starling in his evidence pointed out how progress might be retarded by limiting experimentation to direct utilitarian experiments, to the exclusion of investigation where merely an advance of knowledge was sought. He quoted in support of this the first edition of Pearson's "Grammar of Science," in which the researches of Clerk Maxwell and Hertz on electric waves were mentioned as researches which in one's remotest imagination could not be thought to have any direct practical bearing. Before the second edition appeared these apparently useless researches had led to Marconi's discovery of wireless telegraphy. He further pointed out that the present law forbids a student to experiment on a live animal in order to acquire surgical skill; the student's first anesthetic or his first tracheotomy, and equally the surgeon's first performance of some difficult operation on the stomach or intestine, must therefore perforce be carried out on the human subject. A surgeon must acquire skill somehow, and at present he is forced to do it by experimenting on his human patients. Dr. Starling said he could not believe that the framers of the present law regarded the life of animals as more sacred than that of man, but if they would compare the mortality in a surgeon's first ten cases of resections of bowel with that in his second ten cases, they would see what sacrifice of human life was involved by the present law, a law which he considered to be most immoral.

It is not often that questions of public health are made the subject-matter of pulpit appeals, but Father Bernard Vaughan, who has made himself notorious recently by his pulpit denunciations of the sins of the so-called "smart set," has just commenced another series of sermons in which he continues his attack on the iniquities of "society." In the first of these delivered a few days ago he denounced the modern fashion whereby England was competing with France for the lowest birth-rate in Europe, and he protested against the selfishness of the fashionable woman who, to save herself trouble, feeds her offspring on "concoctions in a bottle" instead of giving it the food which nature has provided. Such practices set but a poor example to the poorer classes, and are the cause of a grave increase in the mortality amongst the ever-decreasing number of children born in this country.

A meeting has just been held at the Royal College of Physicians to decide finally upon the name of the new society which has been formed by the amalgamation of the Royal Medical and Chirurgical Society, the Pathological Society, the Obstetrical and Gynecological Societies, the Neurological, Laryngological, Odontological, and Dermatological Societies. Three names were submitted to the meeting, but the choice lay between "Royal Academy of Medicine" and "Royal Society of Medicine." The latter was finally decided upon by a small majority.

The daily papers have been doing their best for the last few weeks to raise a scare on account of some cases of cerebro-spinal meningitis which have occurred in Scotland. The picturesque name "spotted fever" evidently catches the lay mind; and the fact that a few cases, perhaps no more than might be counted in any year at this season, have occurred in London has added fuel to the flame of sensational report.

A paper was read by Dr. Leonard Guthrie at the Society of Anesthetists this month on those cases in which death occurs soon after administration of an anesthetic, particularly chloroform or ether. Considerable interest was aroused by Dr. Guthrie's publication of several such cases four years ago, and another series still earlier. He came to the conclusion that some sort of autointoxication occurred, as a result of which death took place within ten hours to six days after the anesthetic. This fatal issue was not related to any severity of the operation, but to an intense fatty degeneration or fatty infiltra-

tion of the liver, which allowed the accumulation of toxic substances in the system; and if the kidneys happened to be the seat of disease death was still more likely to occur, for the elimination of the toxic substances was hindered. He now considers that the condition of the liver is not induced entirely by the anesthetic, but was present before, and that the fatty acid intoxication due to the preëxisting state of the liver is increased by the action of the anesthetic on the liver. He thought the condition produced is akin to cyclic vomiting and diabetic coma, in which some acid intoxication is almost certainly present, and the urine contains acetone; this latter feature is observed in the cases of chloroform poisoning. Dr. H. D. Rolleston pointed out that the patient is starved before an operation, and is apt to vomit and be still further starved after operation, and these are undoubtedly possible factors in the causation of acetonuria quite apart from the action of chloroform. The subject is one of great practical interest; it suggests the need for careful attention to the *prima viæ* whereby elimination may be promoted both before and after anesthetics. But, as might be expected, the anesthetists were not going to hear chloroform condemned on insufficient evidence, and Dr. Dudley Buxton, whose large experience as an anesthetist entitled his opinion to much weight, objected to the term "chloroform poisoning" in these cases, for it is not proved, he said, that the symptoms or the fatal result are due to the chloroform.

The Pathological Society at its meeting a few days ago devoted the whole evening to a consideration of the parathyroid glands. These minute masses of glandular tissue which are found in the tissues near the thyroid, though sometimes even in the mediastinum, to the number of ten or twelve, but in varying numbers in different individuals, are so small that they are only to be found on careful search usually, and their nature is to be verified with the microscope, not with the naked eye. It is uncertain whether they produce an internal secretion like that of the thyroid gland, but there is evidence that they are of practical clinical importance: some experimenters have found that in animals the removal of these tiny structures produces death within a few days, and one observer found that implantation of one of these little glands in a case of myxedema produced marked improvement.

All Cambridge graduates will be pleased that the honorable post of Principal of the Glasgow University should have been conferred on Dr. Donald Macalister, who has been so familiar a figure to generations of students at Cambridge. A generation at Cambridge is a triennium; I do not mean to imply that Dr. Donald Macalister is a Methuselah, or even a Nestor—indeed, he is hale and vigorous and likely to do good work for Glasgow University.

But if Cambridge can spare its distinguished alumni to fill important posts in other parts of the kingdom, it can ill afford to lose them by death, and there are few whose fame has been so world-wide as was that of Sir Michael Foster, who has passed away since my last letter. Those who graduated in medicine five-and-twenty years ago will always remember him as one of the great teachers of science in Cambridge at that time, with Sir George Paget and Sir George Humphry. In later years he had given less time to physiology and more to parliamentary work, and his office of secretary to the Royal Society, and his active part in the Royal Commission on Tuberculosis and many other outside duties had removed him to a great extent from the sphere of physiological investigation, but it is as a physiologist that he will be remembered in years to come.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series. Vol. XXXI. | DETROIT, MICH., MAY 15, 1907. | Third Series. Vol. XXIII, No. 5.

ORIGINAL COMMUNICATIONS.

EXTERNAL USE OF ADRENALIN IN NEURALGIA, NEURITIS, AND REFLEX OR REFERRED PAIN.[1]

BY HENRY GUY CARLETON, ATLANTIC CITY, N. J.

Over 500 records of cases have been sent me by physicians since the publication of my first paper in *American Medicine*, on the above subject, February 24, 1906. I have also a large number of reports by intelligent laymen who corresponded with me on the subject, and either tried the treatment on themselves or some member of their family. I requested a physician's presence at these trials, not because of any possible danger, but that the physician might judge, in case of failure, what the concurrent conditions were—failures being as useful as successes in determining the value of the treatment.

The field being extensive and constantly broadening, subdivision is necessary, and before citing the selected reports I will present for consideration certain phenomena noted therein, irreconcilable with present views of the physiologic action of the suprarenal secretion. The manufacturers also put up a 1:1000 solution, which is not nearly so convenient of application in neural cases. This explanation is made necessary by the large number of requests for the formula for making an ointment containing the suprarenal principle.

[1]The Editor has received a number of personal communications indorsing the statements made as to the value of adrenalin for the relief of pain as suggested in this article. He has also received other communications stating that it had signally failed to be of service. This article, compiled by a layman, but personally indorsed by a number of qualified practitioners, is therefore published in order that the facts concerning this important subject may be definitely determined.

1. The only absolute failures noted were of neuralgias springing from toxic conditions, such as intestinal toxemia, the malarial plasmodium in the blood, diabetic and saturnine poison; also some arising from reflex irritation from traumatic or inflammatory lesion of a branch of the same nerve (*e.g.*, a supraorbital neuralgia arising from a violent iritis); also neuralgias and neurites arising from degenerative conditions, as in certain stages of tabes dorsalis and of adiposis dolorosa, especially the former, are refractory in the extreme. There are relievable cases of neural pain from toxic conditions, as those from gout and rheumatism, and these will be discussed.

2. The unvarying successes were of functional neuralgia and neuritis. These comprised neuralgias of all branches of the fifth nerve; neural disorders of the intercostal, cervico-occipital, cervicobrachial nerves; dorsal and lumbar exogenous nerve roots; musculospiral, auriculotemporal, coccygeal, sacral plexus, palmar and plantar; the great sciatic and its extensions; long and short saphenous nerves. The neurites were of the sciatic and its extensions; the palmar and plantar nerves; and several exogenous nerve roots of the dorsal and lumbar vertebras, and postoperative neuromata.

Under certain neural conditions not as yet clearly defined, and in recurrent cases of long standing, also in most neurites, recurrences were noticed in from seven hours to

ten days, but these yielded again to treatment; the interval between attacks became longer and the attacks less violent, till they ceased altogether. Excellent examples of this phenomenon in neuritis are shown in the two cases of sciatica reported by Dr. Charles S. Potts, chief of clinic of nervous diseases, University of Pennsylvania Hospital, and also neurologist of the Philadelphia General Hospital. Generally, however, the length of time before a recurrence, after one treatment by an external application of adrenalin, is a surprise alike to practitioner and patient. Several of these are detailed below. The only explanation which can fit these cases is that adrenalin brings about regeneration of the diseased or exhausted nerve. I present below a group of phenomena leading to the conclusion that regeneration of neural energy and endurance is at least one of the functions of the suprarenal secretion. These phenomena occur with too great regularity to be carelessly regarded.

The specific action of adrenalin in functional neuralgia and neuritis is so unvarying that its failure to relieve may be accepted as diagnostic of reflex neuralgia, or a referred pain, indicating the presence of some perhaps yet unknown morbid condition. True, there are occasional recurrences in functional neuralgia and neuritis of long standing, but they are markedly less violent than the original attack, yield promptly to treatment by adrenalin, and this is followed by a much longer interval of immunity. When the nerve degeneration has progressed too far, neuritis will show briefer periods of relief, as in the case of tic reported by Dr. Morris Booth Miller, professor of surgery at the Polyclinic and Postgraduate Hospital, Philadelphia, and the cases of sciatica of Dr. Potts already mentioned, or perhaps still show plainly, in the pains of tabes, after unmistakable signs of degeneration have set in. In this, however, luetic poison may play a part, if the theory is correct that it is usually associated with spinal cord sclerosis, and those cases of tabes in which adrenalin has been reported as giving relief may have been non-luetic.

Besides the neuralgias and neurites above mentioned, unvaryingly favorable reports have been sent respecting the external use of adrenalin in achillodynia (two cases), twitching of the orbital muscles from eye-strain (three cases), vaginismus (three cases), herpes zoster (four cases), lumbago (nine cases), metrodynia (two cases), one treated by uterine suppository containing three minims adrenalin ointment, one by sacral inunction (three minims on each side).

3. Reflex neuralgias of great severity are commonly relieved for periods varying from a few hours to several months. The most common of these are derived from eye-strain and dental caries. The former usually manifests itself in the supraorbital nerve, the supratrochlear, infratrochlear, and frontal rami being also involved, besides often the cervico-occipital and occipital rami of the second cervical. Frequently it is bilateral, the pain being greatest on the side with the most refractional error. When first treated it will be relieved often for several months. Then will come a fierce recurrence, which cannot be relieved except for perhaps less than an hour. In the first case the regeneration or rejuvenation of the nerve has given it greater endurance, and freedom from pain has encouraged into the patient further outrages upon the eyes, till some violent and unquellable recurrence induces a visit to a competent refractionist. The relief from pain has nothing to do with its exciting cause, as the sequel will show. Diagnosis is here made easy, not only by the above signs, but by the unrelieved ache in the eyeball itself. Reflex neuralgia from dental caries follows the same rule. It usually involves both temporal and malar branches of the superior maxillary nerve, when the caries is in the upper jaw, and the dental and labial when in the lower—pain often centering at the mental foramen. This form is invariably on the side of the affected tooth, though an extra caries may make it bilateral. Mandibular caries, or

acute or chronic periostitis, will give rise to a similar reflex. When the cheek swells from toothache, it is usually from reflex malar neuralgia. Two minims of adrenalin ointment smeared in a semicircle just bordering the parotid gland will relieve the malar neuralgia in three or four minutes, and cause the edema to disappear in about five hours. Often the ache in the tooth itself is so insignificant as not to be felt till after the reflex neuralgia has gone. I made this discovery at Swiftwater, calling Dr. Slee's attention to it, and at once communicated it to others, soon getting reports of cases enough to show the truth of my theory. The cases in which severe pain persisted in the tooth were proved to be from an ulcerated tooth in a closed cavity, no relief being possible till the pressure of gas on the intradental nerve was removed. Reflex otalgia is generally from middle-ear disease, or of the mastoid process. The late Dr. Eduardo Andrade, of Jacksonville, Fla., reported to me last April the case of a well-known resident there who suffered for several years with prostrating attacks of otalgia from otitis mastoidea. Once when morphine failed he gave adrenalin solution 1:1000, putting one drop far down in the ear. Relief came in two and a half minutes. Recurrence came in about a month, and again adrenalin relieved. A third attack found adrenalin ineffective, and morphine was resorted to, with only partial success. Subsequently he used adrenalin ointment, with better results.

The case of reflex neuralgia centered at the mental foramen, reported to me by Dr. Sollace Mitchell, Jacksonville, had complete relief for three weeks from external application of adrenalin ointment. The pain then recurred violently in the temporomalar, and again yielded to adrenalin ointment. A recurrence came in about two weeks more, in the first branch affected, but refused to yield. This case is interesting from the fact that it shows nerve regeneration to have resisted attack in the branch of the inferior maxillary affected first and treated, then recurred in a branch of the superior maxillary, then finally in the same branch of the inferior maxillary. The reflex in this case cannot be from dental caries, as the patient, past eighty, has no teeth, but reflex neuralgia it undoubtedly is.

There have been many neuralgias reported to me by physicians in which adrenalin ointment gave relief for periods varying from a few hours to several weeks, but although they bore the earmarks of reflex in the comparatively short remission and the ferocity of recurrence, there were no data given of concurrent conditions which could determine the classification, or make the cases available for study. Others have omitted to mention the nerve involved, or the quantity of ointment used. One reported complete failure in the case of a "neuralgic headache" in spite of the administration of 25 minims of adrenalin solution by mouth and two drachms by "injection" within two hours. A sphygmomanometric record of this case would have been interesting.

4. "Transferred" pains, so finely described and mapped by Dana and others, are easily relieved by this treatment, but are subject to the same rules of recurrence as reflex neuralgia, depending on the extent of the causative lesion. Adrenalin is an excellent aid to diagnosis, for when the "transferred" pain is checked, the lesser pain near or at the causative lesion is usually made perceptible, and diagnosis made easy. I gave my opinion last April to a friend whose wife, neither gouty nor neurasthenic, had a violently recurrent achillodynia, that the slight pain she felt in the right groin during the periods of relief given by adrenalin were indications that the trouble was ovarian—and that the transferred pain in the heel confirmed this. Her medical adviser pooh-poohed this. He saw her—I had only my friend's letters to guide me, plus a fair knowledge of Dana and Butler's works. The physician was sure it was a subacute appendicitis. Last summer he must have suddenly changed his mind, for his patient underwent an oöphorectomy at St. Luke's Hospital, New York City, and an ovarian

neoplasm was removed. There has been no achillodynia since. Some transferred pains are obstinate till application is made over the nerve efferent from the seat of trouble. A good example of this was a severely painful spot on the inner side of one knee. The physician found that it would yield but slightly to local application of two minims of adrenalin ointment. I advised smearing three minims over the course of the anterior saphenous nerve. He began with the anterior crural nerve, continuing down the saphenous to the entrance to Hunter's canal. The knee pain stopped in three minutes, and did not recur for three weeks. Later, a tuberculous hip-joint was operated upon, and there has yet been no return of the transferred pain. This field will, I am sure, require many years of careful work to map, but its diagnostic value is great.

5. The pains of gout, articular and muscular rheumatism, myalgia, and of at least some trauma, are relieved almost entirely by adrenalin, applied externally. I tried it in one rheumatic case (arthritis deformans) over a year ago, and it gave perfect relief for about ten hours after each application, without increase, but I withheld it from my report because of the doubt in diagnosis, there having been attacks of sciatica and neuralgia before and concurrent with the rheumatic attack, and there was a sufficiency of incredible truth in my report as it was. But it is now a certainty. One case, arthritis (knee-joint), has been kept free from pain all night for now nine weeks at the University of Pennsylvania Hospital. Two minims (0.12 Cc.) of adrenalin ointment is smeared around the leg, about one inch above the upper edge of the patella, when the resident in charge of the ward makes his evening round. This was my suggestion, the object being to intersect both popliteal nerves; the long and short saphenous and fibular cutaneous nerves are involved by such an attack. Cases of gout are in the reports given below. I tried one minim smeared down each side of the first, second, and third cervicals one inch from the median line, when my nurse at the University Hospital, a graduate from the Blockley school, reported for duty suffering from a severe cervical myalgia from cold. Entire relief was given in four minutes, only a slight muscular soreness remaining. There was no recurrence. I reported this to a number of friends. Mr. T. B. Donaldson, secretary of the Alumni Association, University of Pennsylvania, at once tried it on one of his printers, who had been blistering and using liniment for several days without relief, and got immediate and permanent results. Three physicians of record, modestly desiring their names shall be withheld (like the resident of the University of Pennsylvania who has the arthritis case in charge), have reported similar successes in myalgia from cold, and one in a case of muscular rheumatism. No failures reported yet.

The relief of pain in three cases of myalgia is in itself of slight importance, but of considerable neural and pathologic significance. In rheumatic and gouty conditions there is, of course, no direct remedial effect produced by adrenalin, but the relief of the pain must be a considerable factor in maintaining the patient's strength and aiding recovery by conserving the heart's action, and keeping down temperature. This field is one of great promise.

I now pass to a brief presentment of certain phenomena so frequently to be observed in using preparations of adrenalin as to make their significance vivid when correlated.

1. The quantity of adrenalin necessary to relieve neuralgia, or neuritis (including affections of the deeper nerves, like the sciatic), is too small to cause the slightest ischemia, or variation of blood-pressure.

2. There is a decided regeneration of the nerve and its branches, after treatment, rendering it less liable to recurrence of an attack, though predisposing conditions continue or return. I have complete reports of cases 1, 18, and 19 to December 1, November 15, and December 10 respectively, described in my paper published in *American Medicine* of February 24, 1906. No. 1,

with a history of prostrating attacks of unilateral supraorbital and infraorbital neuralgia extending back several years, was treated September 13, 1903, during a severe attack, by external application of five drops of adrenalin chloride solution, diluted with ten drops of water. The pain left in three and one-half minutes, and with the exception of two or three vague touches there had been no recurrence up to December 1, when her husband wrote me from Halifax asking me to send him something for his "eye headache"—a unilateral probably neuralgic from cold. Case 18 in the paper referred to, a woman of thirty, with a long history of constant overwork, lack of proper amount of sleep, badly nourished, and with the typical facies of acromegaly, and complaining for a long time of pain in the left iliac region, had had a number of severe attacks of trigeminal neuralgia, lasting sometimes a week. During most of these attacks work was impossible. September 15, during a severe attack which had cost an entire night's rest, I applied one minim (0.06 Cc.) of adrenalin ointment, smearing it from the temporomalar branch to the supraorbital foramen. The pain departed in three minutes and thirty-five seconds, and up to November 15, 1906, there has not been the slightest recurrence, though her general health has been far from good, and neurasthenic conditions are more conspicuous. Case 19 had a history of long overwork and loss of rest, from nursing a relative, with conditions aggravated by, or reflex from, a metropathic disorder. The neurotic symptoms were general debility, aphonia, almost complete paraplegia, and neuritis of three exogenous nerve roots in the dorsal vertebras. Concurrent with these were anorexia, and persistent insomnia not yielding easily or long to hypnotics. Pain from the lumbar neuritis had been constant for twenty months. September 18, 1905, by consent of her physician, one minim of adrenalin ointment (0.06 Cc.) was applied to each painful spot on the lumbar vertebras. Pain ceased within five minutes. Within a week patient recovered her voice, began to sleep without hypnotics, appetite and strength returned, she walked alone within a fortnight, and although still a great sufferer from the internal trouble, had no return of the neuritis up to November 15, when a grave recrudescence of the internal trouble sent her again to the sanatorium, where at last accounts she was about to undergo an operation.

I have records of nearly a hundred cases in which one application of adrenalin ointment has caused a previously frequently recurrent facial neuralgia, functional or reflex, to cease troubling for periods of from one month to six, and recurrences, reflex from perhaps the same lesion, came in some other nerve than the one afflicted before.

These are irrefutable proofs of nerve regeneration caused by adrenalin.

3. Phenomena attending intravenous administration of adrenalin differ from those following administration by hypodermoclysis or mouth or clyster or hypodermic in the tissues, not only in the rapidity of action, but in the fact that at first there is an upward bound in pressure, with increased frequency, followed by a decided slowing of the pulse without decrease of the augmented pressure, and this again is followed by another staccato gain of tension, reaching the highest point in about three minutes after the first sign of the effect of the injection could be observed. By hypodermoclysis the effect shows an increase of pressure by far less steep gradient, with no second increase. By mouth the first effect is often a marked slowing of the pulse before any tension can be observed, and the pressure-rise is far slower. Intramuscular injection resembles hypodermoclysis in its effect.

These effects are purely neural. When given intravenously the blood-pressure is raised first by stimulation of the intracardiac ganglia lying between the ventricles and auricles. This is shortly followed by retardation as the vagus begins to respond. Then after a brief interval of from a half to a full minute or more comes a decided increase of pressure, caused by the vasomotor chief center and subsidiary centers

in the spinal cord coming into action and creating a general contraction of all the arterioles to greater or less degree, according to the quantity of adrenalin administered.

4. Ischemia simply results from local stimulation of the vasomotor nerve rami in the arterioles immediately within range of the applied adrenalin, causing contraction of the unstriated muscular fibers of the tunica media. The statement of most therapists that the suprarenal principle "stimulates the muscular fibers in blood-vessel walls" is neither correct nor in accord with the brilliant results of the experiments of the great group headed by Brown-Séquard, Tholozan, and Lombard, to whom present knowledge of the vasomotor system is entirely due. The constriction of the arterioles and capillaries when a preparation of adrenalin is liberally applied to skin or mucosa is directly due to its effect upon the vasomotor fibrils with which the tunica media of the arterioles is known to be bountifully supplied.

5. The amount of adrenalin necessary to influence the vasomotor nerves is much greater than that necessary to cure a neuralgia or neuritis, or relieve a reflex or transferred pain. And the amount necessary to influence a sensory nerve by producing anesthesia is slightly greater than necessary to affect the vasomotor rami locally. I have repeatedly relieved or cured (according to whether it was functional or reflex) a severe neuralgia, affecting several branches of the fifth cranial, by applying one minim of adrenalin ointment to the supraorbital foramen, and smearing it over a surface one inch in diameter to facilitate absorption. To produce an ischemia on the same subject six and a half minims were necessary, and to add local anesthesia beyond that naturally consequent upon emptying the blood-vessel at least double that quantity was required.

6. When several branches of the same nerve are neuralgic, the application of adrenalin to one will usually relieve all—*e.g.*, the supraorbital, temporomalar, frontal, mental, and supratrochlear nerves being involved, one minim of adrenalin ointment smeared over the supraorbital foramen only will relieve the pain in all, unless, as before said, the case is toxic in origin. *Per contra*, if the cervico-occipital is also involved, it will not be affected till directly treated.

7. If two or more nerves are involved, originating from different ganglions (*e.g.*, the Gasserian and Meckel's), each will require treatment. There are a few exceptions reported, but the rule generally obtains.

8. While a neuralgia is being relieved by a quantity of adrenalin too small to cause ischemia, the esthesiometer will prove that the tactile sense is unchanged. If anything, it is more delicate after the neuralgia disappears, but this is because the pain distracts attention from the lighter sensation. This disproves the idea so many have expressed to me that the relief is due to anesthesia.

9. I have several times stopped a twitching of the muscles about the eye (orbicularis palpebrarum, and frontalis) resulting from eye-strain, but unaccompanied by any pain, by applying one minim of adrenalin ointment to the palpebral nerves (inferior), though the twitching was all above. These nerves being distinctly motor, and the particular rami being away from the apparent seat of trouble, is another instance of phenomenon numbered 7.

10. The relief of muscular rheumatism, myalgia in the cervical region, or lumbago, taking not over five minutes in the cases now reported, was found in the three tested to be unaccompanied by the slightest loss of tactile sensibility, from the time of application till the pain was entirely gone. Two and a half minims was the largest amount used in any one case—adrenalin ointment in eight cases, adrenalin ointment in two, adrenalin ointment in one. No failures reported.

11. The relief of the angioneurosis of hay-fever can be accomplished more swiftly by smearing one or two minims of ointment containing 1:1000 of adrenalin between the brows and half-way down each side of the nose than by the inunction and spraying of the nasal mucosa, as now in vogue, and

there will be none of that "drawn feeling" of which many complain, due to the ischemia produced by the larger quantity generally employed. The effect in this latter treatment is to allay the irritation of the supraorbital, supratrochlear, and infratrochlear and frontal nerves, and the superior and inferior nasal, the nasal rami of the superior maxillary, and the nasopalatine nerves, all of which are involved in a severe attack. Those rami in the posterior nares which may be affected will be relieved simultaneously, exactly as all branches of the supraorbital affected in a supraorbital neuralgia are relieved when an application of adrenalin ointment is applied only to the supraorbital foramen.

12. The impression that the relief of hemorrhoids from a rectal injection of adrenalin is due to vasoconstriction is absurdly erroneous to any one remembering the pathology of the affection, and the proof that it is entirely due to the effect of adrenalin upon the nerves with which the anus, rectum, and sigmoid flexure are so bountifully supplied is afforded by the effect of about three minims smeared about the anus, upon a surface three inches in diameter. This amount will not produce any ischemia, but will within four minutes allay the reflex irritation of the rami of the inferior hemorrhoidal nerve, the anal rami of the perineal and anococcygeal nerves, which caused reflex contraction of the sphincter and adjacent muscles, occluding the vein. Where the hemorrhoid is due to hepatic pressure upon the portal vein there will be no relief by either method, but in those cases arising from irritation of the neural plexus of the colon and sigmoid by dejecta or salines, or the scybala of habitual constipation, its action is prompt, but the

vill, of course, recur if the cause is re-

ed.

. The relief of asthma by adrenalin is

limited to the variety arising from

ex irritation of the vagus. It is sup-

ed that in some mysterious way the

soconstricting power of the adrenalin

reparation, sprayed upon the mucosa of the nose, reaches the affected muscles and allays the spasm. Yet it is recognized that bronchial asthma is distinctly neurotic. In many cases nasal spraying with adrenalin does relieve, but only when the solution runs down the posterior nares and comes in contact with the pharyngeal mucosa, well supplied with rami of the vagus (pharyngeal branches), with communicating fibers of the spinal accessory and sympathetic, and within easy distance of the ganglion of the trunk of the pneumogastric and of the pharyngeal plexus, which communicates with the coronary and both deep and superficial cardiac plexuses, with their ganglionic enlargements, the connection of the sympathetic being through the so-called sympathetic cord. This appears to explain clearly why a few drops of adrenalin solution poured into the mouth and allowed to trickle back to the pharynx will have as prompt and powerful stimulating effect on the heart as injection into one of the large veins, if at all exceeded by the latter. Of course relief may also be thus given to cardiac asthma, but the accompanying danger to sclerosed or atheromatous blood-vessels from a sudden rise in blood-pressure makes this method of stimulating the heart inadvisable, unless circumstances demand the risk.

Taken singly, these phenomena mean little, but when they appear in heterogeneous and unrelated cases their significance becomes important, and these deductions flow consistently:

1. That the function of the suprarenal glands is to supply or stimulate the function producing the substances consumed in nerve cells, in the discharge of potential activity—whether this be only the Nissl granules or also Robin's myelocytes and the intercellular gray and granular matter.

2. That upon occasion arising it can be supplied to the intracardiac ganglia (vasomotor) in an abnormal quantity capable of stimulating their activity even though the central vasomotor cells be inactive, through syncope, or profound shock, or like condition, and maintaining cardiac action for

some time independently of impulse from cerebral nerve cells.

3. That the fact that the intracardiac ganglia lie between the auricles and ventricles, that the upper vena cava ascendens is also supplied with contractile fibers and with vasomotor ganglia (and is capable under vasomotor stimulation of rhythmic contractions like those of peristalsis), viewed with the further fact that the suprarenals discharge their secretion into the vena cava within three seconds at normal rate of flow of the right auricle, seems to be direct provision for the above named emergency, and explains the ceaseless energy of the heart.

4. That its restocking the nerve cell with kinetoplasm explains the long periods of intermission between neuralgic attacks, and emphasizes the old saying that "neuralgia is the cry of a starved nerve."

The fact that the suprarenals are supplied with branch nerves from the semilunar ganglia, the phrenic, the pneumogastric, and the renal plexus, and have at least two ganglia close to the central vein, has a significant bearing on this view.

Small quantities of adrenalin (*i.e.*, the amount absorbed from an external application of less than two minims of an ointment containing 1:1000) will cause the regeneration of a neuralgic nerve lasting for periods of from three months to three years, as shown in the cases cited. This confirms the hypothesis that its action in small doses is to renew or cause renewal of the kinetoplasm, which acts like electrolyte added to a primary battery which is nearly exhausted—first raising the voltage and amperage to full normal output, then merely storing up ampere hours. Large amounts of adrenalin, however, are capable of direct stimulation of the vasomotor centers, as shown. This is undoubtedly one of nature's provisions for emergency, and particularly shown in the multiplex discharge conduits, conveying the suprarenal secretion into the inferior vena cava, near the part furnished with vasomotor ganglia and a contractile middle coat, and in the provision of the heart with a chain of such ganglia between auricles and ventricles, to be stocked with kinetoplasm if a small quantity be supplied, or be both stimulated and restocked if a larger supply of the suprarenal secretion be poured into the blood. That the motor nerves are also subject to the same laws of influence by adrenalin is unquestionable. I have many times stopped clonic choreic spasm in the calf and foot of a paralyzed leg by applying one minim of adrenalin ointment to the course of the sciatic nerve, either just below the gluteal fold or at the sciatic notch. There was no pain, but frequently recurrent movements showing the motor cells of the sciatic were alone involved. Other involuntary movements, purely motor, have been relieved in the same manner. I call attention to the case reported by Dr. Walter Reynolds illustrating this, and another case he reports illustrating the effect of adrenalin upon the inhibitory rami of the vagus—the action being primarily on the recurrent laryngeal, produced by one-third minim of adrenalin smeared down the center of the windpipe. This experiment showed first a decided stimulation of the vasodilating nerves. The influence of adrenalin is thus shown to include every branch of the nervous system—motor, sensory, and sympathetic—stimulating only when in excessive amounts, but restocking with kinetoplasm, and bringing about regeneration and repair where needed, subject to failure only when destructive degeneration has progressed too far, as in the cases of tabes cited; and failing to relieve the symptom called pain only when vicious toxic or destructive processes make that impossible.

Dr. Charles S. Potts (chief of clinic of nervous diseases, University of Pennsylvania Hospital, and neurologist to the Philadelphia General Hospital) reports: "Last spring I tried an ointment containing 1:1000 of adrenalin in a case of sciatica which had been chronic for about a year. Patient was a barkeeper, aged forty-six, who had been a free drinker at times; could not walk upright, or without great pain, nor sleep except for brief intervals, even under hypnotics allowable in such a chronic case. Achilles reflex absent, knee-jerk present.

Had resorted to all modern methods without improvement in his condition. Last February I had my attention called to the article in *American Medicine* of February 24, 1906, and tried adrenalin ointment, applying two or three minims over the course of the sciatic, from where it comes from under the gluteal fold, and for about three inches down, and about as much from the sciatic notch upward. The effect was certainly uncanny. The pain ceased entirely in four or five minutes, and the man sank almost at once into a deep sleep, which lasted between five and six hours—something he had not done for some months. The pain recurred next day, but disappeared when the treatment was repeated. After a week or so the recurrences came at longer intervals and were less painful, the contractures in the leg lessened, he could straighten up and walk without pain, and was finally discharged from the University Hospital and returned to work, promising to let me know if he ever had a recurrence. I have not heard from him since. Nothing was used with the adrenalin ointment, as I wished to test fully its action in this case.

"On my return from my summer trip another case of sciatica presented at the Philadelphia General Hospital, in a man about fifty. He had been in the hospital about three weeks when I saw him on October 13; had had acute sciatica since April. Examination showed no Achilles jerk; pain and contractures made elevating the affected leg, unflexed, impossible. The usual measures failed entirely to relieve, and the patient found walking painful and difficult and the erect position impossible. I asked Dr. J. W. McConnell, who had his case in charge, to apply about 1½ minims of adrenalin ointment to the sciatic path, beginning at the gluteal fold and thence downward about four inches. He did so, and pain stopped within, possibly, two minutes. Applications were renewed as recurrences came, and the patient was discharged as cured October 23, promising to return in a month and see me at the clinic. I saw him November 11, and made careful examination; found Achilles jerk completely restored; leg formerly affected could be lifted, unflexed, and rotated, in fact was as useful as ever. No sign of recurrence of the pain since he left the hospital.

"I treated a severe case of trigeminal neuralgia with one minim of the same ointment with complete success in not more than three minutes. I myself was the patient, and can certify there has been no recurrence. I have not personally treated a lumbago, but a student at one of my clinics told me that after hearing Dr. C. K. Mills mention the use of adrenalin in neuralgia, he hurried to the bedside of a friend suffering keenly with lumbago, and rubbed several minims along the course of the pain, giving almost instant and permanent relief.

"Failures were as follows: My mother is afflicted with rheumatoid arthritis and at times has severe pain in the joints; during one of these attacks I tried the adrenalin without any material benefit. We used it in a case of tabes in which the pains were very severe and extended down the arm; no benefit was derived, the ointment being rubbed along the spinal column in the cervical region."

Dr. Morris Booth Miller (professor of surgery in the Philadelphia Polyclinic and Postgraduate School) states: "The note I have on adrenalin is very unsatisfactory because, like many such patients, the man did not return to me after the first time. He was a German of about forty-five, with right-sided tic-douloureux affecting the second and third branches of the fifth nerve. He had undergone two operations, but apparently they were only avulsions, and the pain had recurred. I saw him while in pain, and after examining him I sent him home while I thought over the question whether to attack the nerves at their exit first or go straight for the Gasserian ganglion. In the meantime I instructed him to use adrenalin ointment. In a day or two his wife returned to say that his pain was gone and he was again at work. Two or three weeks later she came back to say that he was suffering as much as ever and would call at the clinic,

but I have never seen him. A member of my family used it in some slight neuralgic pains of lithemic origin with success."

Dr. W. Oakley Hermance (formerly on visiting staff, Polyclinic and Postgraduate Hospital, Philadelphia) gives these facts:

"The following notes cover my experience in the treatment of three cases of trifacial neuralgia, one case of sciatica, and two cases of acute gout by the application of adrenalin chloride:

"CASE I.—Adult, aged fifty-four, family history negative. Patient was seized with violent sciatica in the right side of the body. After a progression of four days the sciatic pain became so intense that deep hypodermic injections of morphine and atropine were resorted to, with only temporary relief. The pain finally became so intense that the patient became hysterical, and he stated that unless he was relieved he would attempt his life. At this point I resolved, as an experiment only, to try the use of adrenalin chloride externally, and not being able to secure the adrenalin ointment applied 20 drops of a 1:1000 solution of adrenalin chloride along the course of the sciatic nerve, from its exit upon the thigh to the knee. This application was made at about 10 P.M., and the last previous hypodermic of morphine had been introduced at noon of the same day. I resolved, as a test, to apply the adrenalin solution only as far as the knee, although the pain had been extending to the ankle. Upon visiting the patient the next morning he volunteered the statement that since my visit of the night previous he had suffered no pain except that below the knee, and asked me what I had done the night before to cause the pain in the thigh to disappear. At the time of making the first application I purposely made no mention of what I intended to do either to the patient or the nurse. The disease in this case ran a course of eight weeks, and terminated in perfect recovery, a year having elapsed since that time with no recurrence. At different times I was obliged to repeat the application of adrenalin chloride to relieve the sciatic pain, but after its first application I was not compelled to use opiates in any form. In using the solution of adrenalin it was placed in single drops along the course of the nerve and allowed to dry upon the skin. In the subsequent treatment adrenalin ointment was used.

"In the three cases of trifacial neuralgia, one was of particular interest because of the rapidity with which adrenalin chloride ointment relieved the pain, and because the patient, who had previously been a victim to periodic attacks, has been entirely relieved since the single application of adrenalin chloride, nine months having elapsed since that date and the present time. This case was one of right-sided tic-douloureux, the patient possessing no interesting features as regards family history and previous illnesses, excepting his susceptibility to trifacial neuralgia. He was seized at midnight with a severe paroxysm of neuralgia. I saw him the next day, found him in a highly excited, nervous state, but without doubt in great agony. In this instance, being hurried, I prescribed adrenalin chloride ointment, and directed the patient as to its application, telling him that if not relieved promptly to communicate with me. I saw him the next day, and his statement is that within five minutes after the application of the ointment, to his great surprise the pain subsided, and that by evening the pain had entirely disappeared. The other two cases of trifacial neuralgia are not so interesting. In one of them instantaneous relief was experienced, but the attack recurred within a few days, and it was finally discovered that the cause was a carious tooth. This, of course, made the solution of the question easy, after the removal of the tooth. So far as I know no recurrence of the attack has happened. In three cases relief was not obtained until several hours after the application of the adrenalin, and I attribute this relief in part to internal treatment, which was administered.

"Of the two cases of gout in which I have used adrenalin externally, one stands out as remarkable. The patient, a woman of fifty-four, having been subject to periodic

gouty attacks, was taken with a most atrocious seizure, the pain being centered in the left great toe. Adrenalin chloride had for the moment escaped my mind, and I applied lead-water and laudanum and gave colchicum and salicylates. I was requested to come to the patient's house again within a few hours, and found the pain even greater; at this time, purposely withholding adrenalin, I gave one-quarter of morphine by the needle, without any apparent relief of the pain. The attack up to this time had been present about twelve hours. Six hours after the injection of morphine had been given I again saw the patient and applied adrenalin chloride, and to her surprise and gratification this intense pain ceased within a period of ten minutes. This patient, however, suffered a recurrence two weeks ago, at this time the wrist of the right hand becoming affected. Adrenalin chloride failed entirely in this instance to relieve the pain, which was only subdued by a deep injection of morphine in the forearm. The remaining case of gouty pain was relieved by applications of adrenalin chloride, but is not so remarkable because the pain was of moderate severity, or the attack evidently not a severe one. My uses up to the present time of adrenalin chloride, when applied in this manner, are confined only to my clinical experience, not having sought for any physiologic reason for its action. Of the cases cited three were most remarkable, the relief occurring, as I have stated, within the short space of ten minutes, and after other well-known resources had failed. I cannot explain the failure of the drug to act favorably in the first case of gout."

Dr. Walter Reynolds (ex-president Atlantic County Medical Society, member American Medical Association, ex-resident physician St. Agnes Hospital, Philadelphia, etc., etc.) writes:

"I wish to report some cases in which adrenalin used externally has given remarkably satisfactory results:

"CASE I.—A lady, aged sixty, ten years ago suffered a severe bruising of the left shoulder from being thrown out of a carriage. For the past five years she has had periodical attacks of neuralgia of the injured arm, mainly in the parts supplied by the musculospiral and ulnar nerves. Various methods of treatment were used in this case, but only partial relief was obtained at any time—a capsule containing acetanilide 2 grains with caffeine ½ grain, and chloroform liniment applied to the back of the hand giving more satisfaction than any other form of treatment until recently. During an attack which had lasted for a week two minims of adrenalin ointment (1:1000) was applied around the arm about an inch below the axilla. The patient had been awakened at 1 A.M. by the pain; in five minutes the pain was entirely relieved, and the patient went back to bed and slept until morning. The next night the pain returned in milder form, and was again relieved in a few minutes by the application of the adrenalin ointment. Since then (two weeks ago) there has been no return of the pain.

"CASE II.—A man, occupation carpenter, had been laid up with sciatica for two months. I directed the application of three minims of adrenalin ointment along the course of the sciatic nerve. The patient was at once entirely relieved and was soon able to return to work. In this case the patient could not tell the exact time required to relieve the pain, but was positive that the effect was gotten in less than half an hour on each occasion. This patient had been treated at first with salicylates and alkalies, later with iodides, but the results were extremely slow as compared with those produced by the adrenalin.

"CASE III.—A man, physician, was troubled with irritation of the ocular muscles, spasmodic twitching, etc., a condition probably due to eye-strain. A single application of ½ minim of the adrenalin ointment over the upper eyelid and about the external canthus of each eye stopped the trouble within five minutes, and there has been no return since—ten days ago.

"CASE IV.—A man had been troubled for several days with laryngitis, causing a dry, annoying cough; the application of one-half minim of the adrenalin ointment over the larynx relieved the cough instantly, and

there was no return of it in the slightest degree.

"CASE V.—Miss C., graduate nurse, had an irritating cough which had existed for two days; a single application of one-half minim adrenalin ointment over the larynx gave immediate relief, without return of the trouble.

"You asked me recently to witness the effect of adrenalin applied externally, your object being to prove that it acts directly upon the nerves. You applied one-third minim adrenalin ointment (1:1000) near your recurrent laryngeal nerve. In one minute after the application your pulse jumped from 68 to 84 beats per minute, with a corresponding decrease in its force. Upon auscultation the heart, previously in good condition, appeared greatly affected, so much so that I felt it necessary to give aromatic spirit of ammonia to overcome the depression. In half an hour, the stimulating effect of the ammonia having disappeared, the pulse-rate fell and the tension went above normal. About a week later the experiment was again tried in my presence. The same amount of adrenalin ointment was applied, with the result that the rate of the pulse changed from 80 to 120 beats per minute, but the constitutional symptoms were not so marked as in the previous experiment."

Dr. Richard Slee (of Pocono Laboratories, Swiftwater, Pa.) makes a brief report of his experience in treating neuralgia and neuritis by inunction with ointment containing one one-thousandth part of the active suprarenal principle:

"1. My first case was one of neuralgia of both supraorbitals, deep-seated pain in the eyeball itself, and dull ache of the rami of the frontal and supratrochlear nerves. I brought the patient to you, to observe your method and time results; you applied about one minim of adrenalin ointment to the supraorbital foramen only, spreading it over an area possibly an inch in diameter. In three minutes and four seconds the patient said the pain was going on the left side (where the application was made), but still remained on the right side. You then remarked that eye-strain was the probable cause—a fact which I very well knew, as the patient was my sister-in-law, and her frequent neuralgias always followed her neglect to wear her glasses, as prescribed by Dr. Gould. In about twenty seconds more the patient said all pain was gone from that side, but persisted on the other, though not so severely, and was confined to the supraorbital. You applied a minim there, and in three minutes and a quarter that trouble ceased. This was done June 14, and up to date, strange to say, although she has constantly violated Dr. Gould's injunction, she has never had a recurrence of the neuralgia. Her nearest approach to an attack was August 16, when she complained to her mother of pains in the scalp, back of the vertex, but it did not last and I did not see her while suffering.

"2. An old patient of mine, stopping at Pocono, sent for me. An attack of sciatica, for which I had treated her for ten years, but without much benefit, had supervened, together with a severe trifacial, involving mainly the temporomalar and frontal rami of the fifth, and bilateral. I applied one minim of adrenalin ointment to the malar, just along the anterior edge of the parotid gland. In about three minutes and one-quarter the neuralgia had entirely disappeared. I then applied one minim to the lower sciatic, from an inch above the fork to about an inch down the popliteals—seat of the most intense pain. Complete relief came in less than three minutes, and there has been no relapse, either sciatic or neuralgic, since. This case bears date in my book of June 28.

"3. Severe unilateral supraorbital neuralgia, relieved in about three minutes by one minim of adrenalin ointment applied over supraorbital foramen; no relapse to date, although weather has been very changeable and often cold, and patient, being in fourth month of pregnancy, not in very good physical condition. This case bears date July 2.

"4. Trigeminal neuralgia, involving temporomalar, anterior dental, malar, and rami of the labial; cheek quite edematous; chief

seat of pain being in malar, and had been progressing four days when I saw patient. Obvious cause was an exposed nerve in the third molar, upper, though patient felt no pain in that. Applied one and one-half minims to the malar, anterior to the parotid gland, where greatest pain centered, and one-half minim to mental foramen. Complete relief of neuralgia in a little over three minutes. The pain in the molar was now perceptible. I told the patient to come back in four hours. She did so, and showed no edema, proving that to have been entirely due to the reflex neuralgic condition, and not to the tooth, which still ached dully and was still untreated. I applied an obtundent to the tooth to relieve, pending a visit next day to her dentist. I consider this an interesting case.

"5. Neuritis of exogenous fibers, third dorsal, bilateral. Had been gradually increasing in severity for about two weeks, with varying intensity of pain, but no complete remission. Had no lack of pupilary reflex, no irregularity of coördination or lightning pains. I applied one minim of adrenalin ointment to each side; all pain left within three minutes, and though five weeks have passed there has been no recurrence. This case may have been incipient tabes, and I am keeping in touch with it.

"6. Neuralgia of anterior dorsal and short saphenous; pain most intense along outer edge of left foot. One minim at a point just below the malleolus relieved in three minutes. No return yet—about three weeks.

"7. Neuralgia of supraorbital, unilateral, involving frontal rami. One minim of adrenalin ointment, applied over supraorbital foramen only, afforded complete relief in three minutes.

"8. Incipient tabes, as diagnosed by a New York specialist; incoördination apparent in gait; complained of severe pain in anterior plantar. Had no chance to examine for nerve-root inflammation, as he was leaving for town, but two applications of one minim each along the affected plantar gave no relief.

"9. Five different applications to the supraorbital foramen, in attacks of neuralgia to which I am subject, about the second day of a recurrent intestinal toxemia, failed to relieve; but—

"10. In a severe neuralgia of that same nerve, clearly due to a cold and damp drive at night and unaccompanied by the slightest sign of intestinal or gastric derangement, one minim of adrenalin ointment gave perfect relief in about three minutes. The results in this and the case above are in exact accord with what you say of the conditions under which your discovery will prove ineffective or be a specific.

"11. Trifacial, most severe in supraorbital; treated exactly as in above case, with prompt and entire relief.

"12. Frontal neuralgia from unquestionable eye-strain, patient having broken her glasses several days before, and not refraining from reading. One minim of adrenalin ointment over supraorbital foramen dissipated the neuralgia completely from all the branches of the fifth, leaving only a dull intraocular ache, probably from the ophthalmic and ciliary nerves. This persisted for some hours, but the patient said it was as nothing to what she had been suffering.

"These few cases from my summer practice have convinced me that there is a hitherto unrecognized physiologic power in the suprarenal secretion, shown clearly by its action in the above cases to be especially directed to nerve repair, and of supreme value in the neural therapy, and I confess to having my usual skepticism entirely removed. As you say, the therapists have not been out of line, but they have only taken notice of its action (in large doses) upon one set of nerves, the vasomotor, failing in some mysterious way to discover the value of its physiologic action in much smaller quantities upon functional and sympathetic affections of the afferent nervous system, with its accompanying tortures."

H. F. Greaney (graduate nurse, vice-president Pennsylvania State Association of Graduate Nurses) reports on behalf of a patient as follows:

"My patient desires me to thank you for his remarkable relief from pain during his

past four successive attacks of gout by the use of your discovery. My attention was first drawn to it by a physician in Philadelphia (a close friend for years of the patient), with whom I had just called on you at the University of Pennsylvania Hospital. On returning to his office the physician gave me a tube of adrenalin ointment, 1:1000, and asked me to try it at the first opportunity. You had explained to me the method of use. This was early last November. Shortly after this the patient had an attack, three joints being involved and the pain being intense. As a trial I treated one limb just above the swelling with two minims of the ointment, smeared on. The pain in that joint stopped in exactly one minute. Shortly after the patient's attending physician arrived, and I told him of the experiment and of its success, and asked if I could show him by trying on the still painful joints. He consented, and the same result came again in one minute. There was no recurrence of pain until the next day, and a second application ended it. In the second and third attacks the results were the same, relief coming, perhaps, a minute more slowly—two minutes in all. In the third attack a sharp sciatica developed, including sciatic nerve and tibials, which was relieved in two minutes by smearing two minims adrenalin ointment, 1:1000, down the course of the sciatic nerve from gluteal fold, and one minim on inner side of affected ankle. In the fourth attack one wrist resisted the treatment for a while, but both ankles yielded as usual. I have nursed this patient through sixteen years of gout, and he always suffered agony before. The relief to the heart was marked.

"I myself used one-half minim of the ointment one day, as you suggested, to relieve pain in heart, throat, and left arm, a few days after an attack of angina, applied along upper edge of collar-bone two inches from left carotid artery. The pain stopped in heart, throat, and arm in one second, and did not recur for several days, and then but feebly."

These points should be remembered:

The quantity of 1:1000 ointment of adrenalin to be used in any affection of a peripheral nerve should not exceed from one to two minims (.06 Cc. to .12 Cc.) by inunction, except in case of the sciatic nerve, when two to three minims may be used. Larger quantities often produce ischemia, which might prove injurious in some cases, notably when application on or near the spine is necessary. Administration by mouth or hypodermically is of little use in neural cases. I have proved this frequently.

The usual time for relief is three minutes. Apparent delay is sometimes caused by mnemonic persistence of the impression, as can be easily proven.

There are many cases of relief from painful conditions uncited because not yet thoroughly tested. But of these I select one—a long-standing case of spastic mucocolitis which had persisted five years with frequent and severe exacerbations. The patient was hemiplegic, and a sufferer from biliary cirrhosis.

An application of 1½ minims of an ointment containing 1:1000 of adrenalin was smeared down the sides of the fourth lumbar and the sacrum. The result was prompt and gratifying, showing the effect on the sciatic and pudic nerves, and the pelvic, mesenteric, hemorrhoidal, hypogastric, and vesical plexuses, through the great gangliated cord of the sympathetic. Within five minutes spasticity and choreic spasms ceased in the paralyzed leg; the tense abdominal muscles relaxed; spastic contractures of the anal and vesical sphincters ended. There was no longer hyperesthesia of those parts, and sleep became possible.

Accompanying these improved conditions was a decided increase in peristalsis and a cessation of the febrile temperature which had prevailed for several months. There was no loss of normal feeling, but only that of reflex pain and contractions, and freedom from these made the elimination of mucus easy, and free from tenesmus. Spasticity of the arm continued, till greatly lessened by the application of two minims of the same ointment girdling the brachial plexus,

and an equal amount half-girdling the wrist on the thumb side.

These effects lasted at first twelve hours, then about twenty hours, then three days. Repeating the application restored the relief in about five minutes. These experiments were witnessed by Dr. Walter Reynolds, after his report had been written.

Application from and including the fourth lumbar, sacrum, and coccyx (two minims down each side) promptly relieved and reduced a severe case of hemorrhoids.

In yet another case painful tenesmus was kept in subjection by the same treatment. A glance at Toldt's fine map of the sacral, lumbar, and coccygeal nerves and plexuses (Toldt's Anatomy, Part VI, on pages 885 and 890) will show the rationale of these results, and indicate the value of similar applications to the fifth lumbar and sacrum in many cases where the abdominal and some where the pelvic viscera are involved.

The fact that the nerves supplying the cervix uteri are derived from the hypogastric plexus, the sacral ganglia, and the sacral nerves, is strongly indicative that hope may be had of similar benefits in labor made excessively painful by reflex nerve flurries.

Since writing the above Dr. Thos. G. Dunlap, of this city, has tried this in a case where he expected difficult labor—a primipara. The adrenalin ointment was applied from the fifth lumbar down, with the result that the patient had a remarkably painless labor. No other means of alleviation was employed.

I will soon have reports from practitioners of record covering this field.

As a final word, I cannot too strongly remind my readers that all these results are obtained by *external* applications in the *manner and quantity given.*

Also that failure may be expected, for reasons given, in all neuralgias due to toxic causes—malarial, intestinal, diabetic, etc., and in the multiple neurites from long-continued alcoholic excess. The reflex neuralgia of eye-strain is often fiercely intractable and soon recurrent, and the pangs of true tabes, Pott's disease, and adiposis dolorosa are hopeless when the roots and ganglia have degenerated beyond repair. Also in gout and rheumatism there are times when no relief follows inunction, but these are temporary and are succeeded by longer periods, when relief is speedy and complete. The former are due to an influx of uric acid or of sodium biurate into the blood current, or flooding some one joint.

Finally, I would say that this therapy cannot be successful in the hands of one whose memory of nerves, their ganglia, roots, distribution, and functions has become blurred through long disuse, and to such I would recommend a careful look at Toldt's Anatomy, Part VI, and the tables of the nerves and of the ganglia in Gould's dictionary, before deciding where the application should be made.

This may sound impertinent, but I have known some excellent practitioners who abandoned cases, afterward treated successfully when I pointed out their errors, frankly admitting that they had not looked at a nerve map for years.

This use of the suprarenal principle is a new and immense field, full of surprises and promise, but also of disappointment to the heedless.

ATLANTIC CITY, N. J.

OCULAR MANIFESTATIONS IN VENEREAL DISEASES.[1]

BY AARON BRAV, M.D.,

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Venus is responsible for many of the ills that human flesh is heir to. Her pernicious influence manifests itself not only in him who worships her, but is also transmitted to the third and fourth generations of him that loves her, while showing mercy and kindness unto a thousand generations of him that hates her and disobeys her commandments. The eye cannot escape her venom. The ocular affections probably traceable to her doors are direct and indirect—direct when they appear as complications during the acute stages of the disease, indirect when they are the sequelæ of the disease or when they are transmitted from parents to children as a result of hereditary environments, so common in the venereal diseases. The percentage of ocular affections attributable to venereal sources is rather large, and a great proportion of the blind have sacrificed their eyesight upon the altar of venery.

The venereal diseases affecting the eyes are gonorrhea and syphilis. These diseases are unequally distributed, being more common in the male than in the female sex. They are found in all strata of society; no one is immune to them, and while the acute symptoms are of a well-defined classical nature, the chronic elements are of a more modified and diverse character. These two diseases differ widely in their pathology, symptomatology, course, prognosis, and treatment. The one is an acute infectious disease, the other is a subacute or chronic disease; both however are acquired as a result of sexual intercourse, although the possibility of infection through other channels is not entirely excluded. The one is of short, the other of rather long duration. The one has acute inflammatory signs for the symptomatic expression of the disease, the other has a slow and gradual creeping degenerative action on the various tissues. The one yields readily to active treatment and leaves its victim apparently free from any further serious condition as far as the patient himself is concerned; the other, while yielding ultimately to treatment, requires years for the complete elimination of its toxins if ever they are completely eliminated, and the patient is rarely entirely free from the effect of the disease, for the tissue changes have produced such modification in the normal harmony of the structures and cellular activities as to always predispose to various diseases which are considered syphilitic in origin. Both these diseases may be complicated by ocular conditions in their respective stages. Both diseases are caused by germs, the one by Neisser's gonococcus, the other by Schaudinn's and Hoffman's spirochæta pallida. Both are acquired through the same channels, and both are contagious; the one, however, is a constitutional disease having a local lesion for its first symptomatic expression, while the other is a local disease which by a septic process may, but rarely, become constitutional. The ocular conditions of the one are manifestations of a general constitutional invasion, while of the other they are complications the infectious nature of which has been carried to the eye, not by endogenic channels but through carelessness and from external sources.

The gonorrheal complications are infections of the conjunctiva, which may involve the cornea and the iris. The conjunctival inflammations of gonorrheal origin may be acquired or congenital. The syphilitic complications are acquired or hereditary. The acquired form of ocular infection due to gonorrhea is known as gonorrheal ophthalmia adultorum, while the congenital form is known as ophthalmia neonatorum. Antepartum conjunctivitis or infection *in utero,* while possible, is a rarity indeed.

Gonorrheal ophthalmia of the adult is a

[1]Read before the Northern Medical Society, Dec. 14, 1906.

very serious affection which may lead, if drastic measures are not instituted early, to partial or total blindness. I have seen several cases of total blindness in this affection by the fifth day of the disease. This disease may be acquired during an acute specific urethritis, or, as is often the case, while nursing children with an ophthalmia neonatorum. In both events the infectious material is introduced into the eye from the genito-urinary tract. Gonorrheal ophthalmia of the adult type may also occur in little children, especially in girls. I have an interesting case on record at the Southern Eye Clinic of a child only sixteen months old suffering from this disease. The condition was unilateral, and when I first saw the patient on the fourth day of the disease the cornea was already affected beyond redemption. This child, suffering from measles, was sent to one of the city hospitals, where it contracted a genital gonorrhea, and was then sent home free from morbilli in exchange for a vaginal discharge, which resulted in infection to the eye, with subsequent unilateral total blindness. A very innocent etiologic factor indeed.

The disease manifests itself by acute inflammatory symptoms of the conjunctiva and edema of the lids, pain, and photophobia. The period of incubation is short, while the progress of the disease is very rapid. Of course the chief danger is in the destruction of the vitality of the cornea. The disintegration and sloughing of the cornea is caused by the infectious nature of the discharge. Ulceration of the cornea when already developed before treatment has been instituted as a rule leads to partial or total destruction of the cornea. The rapidity with which this destruction makes its appearance depends upon the resisting power of the cornea and the virulence of the infecting germ. The usual sequelæ of this disease are adherent leucoma, total anterior staphyloma, panophthalmitis, and atrophy of the bulb. Of course these result only in those cases that come too late under observation or in which treatment has been discontinued too early, for very often ulceration of the cornea sets in when convalescence is apparently established. De Schweinitz says that "a fully developed gonorrheal ophthalmia rarely recovers without involving the cornea, and only too often the eye is hopelessly marred." Iritis and cyclitis may also develop as a complication and destroy the usefulness of the eye.

The percentage of blindness resulting from this form of gonorrheal ophthalmia is not determined with any amount of accuracy. In the table of Magnus the percentage of total blindness is given as rather low. In 2328 cases of blindness only 23 cases were caused by gonorrheal ophthalmia in the adult. Of course the disease is preventable, and therefore not very frequent.

The most frequent ocular disease complicating this venereal affection is ophthalmia neonatorum, which is a disease of the new-born child infected by the vaginal secretion of the mother while passing a parturient canal harboring the gonococci, which, though latent in the vagina on account of the unfavorable media and the toughness and resisting power of the vaginal mucous membrane, find a good culture media in the delicate conjunctival tissue of the new-born infant. It is therefore not a hereditary but a congenital condition. This is also a very serious affection and a very frequent one, but not so rapid in its destructiveness as the adult type. The diagnosis, while easy from a clinical standpoint, can only be made with positiveness after a careful microscopic examination which reveals the presence of the gonococci. It is well, however, for the general practitioner to consider every conjunctival affection occurring in a child within the first week of its life to be of gonorrheal origin and institute energetic treatment, and thus give the child the benefit of a doubt rather than be caught unawares. The seriousness of the disease can only be appreciated when we take into consideration that only a few years ago it was responsible for 50 per cent of the cases of total blindness. Fortunately the

number of cases of blindness caused by this disease has been reduced by the prophylactic measures of Credé. Since the introduction of Credé's method the number of cases of ophthalmia neonatorum has diminished to a considerable degree, and at present it occurs mostly in those cases where Credé's method has been neglected and where midwives have acted as accoucheurs. The midwives as a rule attribute an early conjunctival disease to a cold, and the family consequently is not warned of the impending danger, when treatment is delayed; and it is in these cases that the physician is apt to find corneal complications at his first visit. Corneal complications, however mild in this disease, mean a partial or total blind eye as a sequel.

To emphasize the importance of early and energetic prophylactic measures I will cite statistics which give the percentage of blindness due to ophthalmia neonatorum. The committee of the Ophthalmological Society of the United Kingdom has reported that from 39 to 40 per cent of the inmates of four blind asylums in Great Britain owe their blindness to it. Reinhard in 22 German asylums found 658 cases out of a total of 2165—*i.e.*, 30 per cent were blind from this disease. The British Royal Commission estimated that there were about 7000 persons in the United Kingdom who had lost their sight from gonorrheal ophthalmia, or about 22 per cent. Of the 50,568 blind persons in the United States in 1890, according to Burnett at least 30 per cent lost their sight from ophthalmia neonatorum. Of course since the introduction of Credé's method the number of blind have materially diminished, but nevertheless next to optic atrophy this disease is still producing the greatest number of blind.

Iritis is another complication that may occur during an attack of gonorrhea. Gonorrheal iritis is not very frequent. It appears as a constitutional complication in those cases in which a gonorrhea has given rise to a general infection. Iritis of gonorrheal origin as a rule sets in after an outbreak of gonorrheal arthritis. In some cases we find it without joint affection. In its external appearance gonorrheal iritis resembles rheumatic iritis, and like the arthritis has a tendency to recur, and is usually associated with a return of the urethral discharge or a return of the swelling of the joint. No other ocular affections have been attributed to gonorrhea, yet uveal inflammations as a result of constitutional invasion are not entirely improbable. As to heredity, it is well to mention that in some cases it has been found that microphthalmus in the child was the result of gonorrheal ophthalmia in the father. Dutchman has produced the same condition experimentally in animals.

While the gonorrheal ocular complications are limited to the above mentioned conditions, the syphilitic affections of the eye can be stated without fear of contradiction to comprise all possible diseases of the eye with which the present-day ophthalmologist is acquainted. The entire visual apparatus—extrabulbar, intrabulbar, retrobulbar, and intracranial—are all subject to this scourge of modern civilization. Beginning with the lids and to the very visual centers in the occipital region, all the connecting cranial nervous elements may be affected during the life history of a syphilitic. These complications may occur at any stage of the disease, may appear in the so-called parasyphilitic stage, and it is not quite certain that a previous long-continued mercurial treatment will have a positive effect in the prevention of ocular syphilitic sequelæ. This is due to the fact that the syphilitic toxins have so modified the functions of the various organs of the body as to predispose them to all possible degenerations. The transmission of ocular weakness as a result of hereditary influences is characteristic of this disease, so that the second and third generations are not immune.

Chancre of the lid appears of course as a primary condition, and we shall not discuss it in this paper. The lids may be the seat of a primary lesion, secondary infec-

tion, and tertiary manifestation. As a manifestation of secondary infection they appear as papular syphilides or ulcers, while the tertiary manifestations are of a gummatous nature of the skin of the lids which eventually break down and ulcerate, when they are spoken of as tertiary ulcers. Gumma of the lids as a hereditary manifestation is very rare. In children with hereditary syphilis a papular eruption may be found shortly after birth. Syphilitic blepharitis has been described occurring as a result of hereditary syphilis, in which the edges of the lids become ulcerated and the eyelashes fall out. This condition may also occur in the acquired form. The conjunctiva may be the seat of syphilitic eruption, ulcerated syphilides, or a syphilitic conjunctivitis may develop which does not yield to local treatment but is amenable to antisyphilitic measures. The diagnosis in these cases can only be made with any degree of positiveness when other secondary lesions are present. Orbital periostitis is often caused by syphilis and appears as a swelling, giving rise to exophthalmus, pain, and neuralgia, due to compression. Orbital periostitis, while usually a later manifestation, may sometimes occur in the early stages and may even be one of the first symptoms of constitutional infection, occurring sometimes shortly after the initial lesion, and may occur sometimes in children born of syphilitic parents. It is, however, of a more benign nature in the acquired form, where it yields more readily to treatment. Corneal involvement as a result of syphilitic infection is not infrequent and is characteristic. It is of the interstitial variety. It may be unilateral, but is usually bilateral, although one eye is affected first. This disease is common among the negroes and the Irish, but is less frequently found among the Jews, as hereditary syphilis is as yet not very common among the Jews. The disease runs a very long course, requiring months and often years for a cure, although the prognosis is favorable when no complication sets in. The infiltration under proper treatment slowly disappears and the cornea usually regains its transparency. There is always, however, a reduction in the visual acuity. In complicated cases serious conditions may arise resulting in partial or total blindness. As a rule there is no ulceration in this form of keratitis, but a deep vascularization which is characteristic of the disease. The majority of cases of interstitial keratitis are of a hereditary nature. Occasionally it occurs in the acquired form. It occurs usually in the young, from the age of five to fifteen, rarely it manifests itself *in utero,* and the child then comes into this world with either impaired vision or congenital blindness.

Iritis is very frequently of syphilitic origin. Fuchs says that "at least half of all the cases of iritis are referable to it." In these cases it is mostly the acquired form we have to deal with. The diagnosis is not often positive. Of course the presence of syphilitic nodules on the iris and their prompt disappearance under antisyphilitic treatment is sufficient evidence of its etiologic factor. In cases in which the diagnosis is not clear it is well to search for corroborative evidence. Syphilitic iritis occurs in the secondary stage, more rarely in the tertiary, in the form of iritis gummosa, in which cases the growths may attain considerable dimensions and destroy the eye. Syphilitic iritis manifests a great tendency to recur, so that the patient is never free from it. Syphilitic iritis may manifest itself in children as a result of hereditary influence, and in some cases iritis occurs *in utero,* and the child is born with the evidence of it by the symptoms of posterior synechia and occlusion of the pupil, atrophy of the iris, and even atrophy of the eyeball.

Syphiloma of the ciliary body occurs in the acquired form of syphilis. This growth may be the size of a pea or may reach the size of a small nut. The disease commences with a violent inflammation and presents the aspect of a severe case of iridocyclitis lasting from a few days to several weeks, and occurs mostly in the third decade of life. Out of 66 cases re-

ported in the literature, 42, or 63.6 per cent, grew blind; the rest had some vision, only 10 per cent had any considerable vision. The prognosis is of course very grave; 28 per cent of the cases resulted in atrophy of the eyeball; in 30 per cent enucleation had to be resorted to to relieve pain. As to the mode of development, 42 per cent developed in the first two months after the infection, 22 per cent in the second half-year, and in a few cases it occurred later. In 50 per cent it was accompanied by secondary symptoms.

Syphiloma of the ciliary bodies belongs to the early manifestations of constitutional syphilis and occurs before the gummatous period. Of course the rapid destruction of sight is due to complications in the vitreous, choroid, and retina; of which detachment of the retina is the most frequent.

Ophthalmologists are still divided in their opinion on syphilitic retinitis. It is well to note, however, that no less a clinician than Fuchs claims that "acquired syphilis is one of the most frequent causes of retinitis." As a rule syphilitic retinitis is associated with other uveal inflammations, especially of the choroid. Two forms of retinitis are recognized, namely, the diffused and the circumscribed. All authorities, however, agree that the most frequent manifestation of retinal disease is in association with a diseased condition of the choroid, and is usually spoken of as choroidoretinitis or retinochoroiditis. It is important to say that all these diseases greatly reduce the acuity of vision and very often cause blindness. Pigmentary degeneration of the retina, which closely resembles syphilitic retinitis, has as yet not been attributed to syphilis by many; its etiology is practically unknown. I feel, however, very much inclined to attribute it to some degenerative process as a result of hereditary syphilis perhaps of the second or the third generation. Of course I have no direct evidence to corroborate my suspicion, yet it is more plausible than to attribute it to consanguinity, which really explains very little.

The optic nerve is frequently involved in syphilitic infection, either in a process of inflammation or in a process of degeneration. The inflammation appears in the form of optic neuritis, the degenerative condition manifesting itself as a primary optic atrophy. Optic neuritis is often caused by syphilis. The optic nerve may be attacked by the syphilitic virus directly, or indirectly owing to the development in the cranial cavity; or in the orbit inflammations or tumors may develop which are syphilitic in origin and secondarily involve the optic nerve. Optic atrophy, primary or progressive atrophy, which usually leads to total blindness, is in the majority of cases of syphilitic origin, appears in the so-called parasyphilitic stage, and very often is the first symptom of tabes dorsalis. This atrophy is of a non-inflammatory nature, differing in this respect from the atrophy in consequence of neuritis. Optic atrophy is a frequent cause of blindness, and is, according to Magnus, responsible for 20 per cent of the totally blind.

Oculomotor paralysis is a not infrequent condition, and is also a heritage of syphilitic disease. If not all, at least 80 per cent are of syphilitic origin, occurring usually years after the primary lesion. We may have a total or only a partial palsy, depending entirely upon the extent and seat of the lesion.

The other extrinsic muscles may also be paralyzed as a result of syphilitic infection. Ptosis and the Argyll-Robertson pupil are in the majority of cases attributable to lues.

It is impossible to give a clear estimate of the percentage of ocular affection in syphilis. De Wecker gives 15 per cent of ocular involvement, which is most probably underestimated. It is necessary to follow a certain number of cases from the time of infection until death to enable one to give correct data on the exact percentage of ocular involvement, which of course is practically impossible.

Venereal infections are on the increase, so much so that at present the social evil is receiving considerable attention, both from the profession and the laity, who conjointly organize to combat the evil results

by preventive measures in the nature of educational campaigns. Compulsory registration has not proved successful in other countries, and is not likely to be adopted in this country, although it is the only means available to us at present; so that we are still unable to prevent the evil which is responsible for so many ills and about 60 per cent of the blind, which is attributable directly or indirectly to venereal affections.

Some consideration as to the therapeutics of the diseases described will I feel sure be of considerable interest to the general practitioner, who is consulted on many of the conditions mentioned above. Preventive measures are of course the most desirable. In the prevention of gonorrheal ocular complications the method of Credé —that is, the instillation of a drop of a two-per-cent solution of silver nitrate—is very important, and should be employed not only in hospitals but also in private practice, especially where there is a suspicion as to the possibility of gonococci within the vaginal canal. The argument that the silver solution often produces an inflammation of the conjunctiva is not deserving any consideration when its usefulness is carefully measured. Neither protargol nor argyrol nor any other of the silver salts can serve as a substitute for the nitrate; they are positively useless in the prevention of the development of this disease, and should not be used as a prophylactic measure. Gonorrheal ophthalmia of the adult is also a preventable disease. In all cases of acute urethritis the patient should be told of the danger to his eyes and advised to carefully wash his hands, after every contact with his genital organs, with hot water and a bichloride solution 1:1000, so as to be on the safe side. Children suffering from genital discharge should be carefully guarded and their hands cleansed several times daily. In nursing cases of gonorrheal ophthalmia the nurse must be instructed to take particular care of herself. These prophylactic measures will reduce the gonorrheal ocular manifestations to a minimum.

As to the treatment proper in ophthalmia neonatorum, the chief aim is to keep the conjunctival sac as clean and aseptic as possible so as to prevent the involvement of the cornea in the disease process. To accomplish this end a saturated solution of boric acid, or a 1:5000 solution of corrosive sublimate, may be employed. The conjunctiva should be thoroughly flushed and every drop of pus removed. This should be executed with a religious fervor every hour, for the discharge in these cases reaccumulates with marked rapidity. Within an hour after the sac has been cleansed the discharge is again profuse. Ice compresses are indispensable and should be applied constantly for the first five days, while the conjunctiva is swollen and the discharge profuse. These compresses are best made in the form of pledgets of cotton, and should be changed every ten minutes; this lessens the irritation, reduces the swelling, and prevents a rapid multiplication of the germs and the simultaneous reproduction of the discharge. The lids should be brushed twice daily with a two-per-cent solution of silver nitrate by the attending physician, while a 20-per-cent solution of argyrol may be instilled by a member of the family or attending nurse several times during the day at intervals of two hours. Atropine is not necessary in ordinary cases, but should be used in stubborn cases. One drop of a one-per-cent solution should be instilled three times daily. Complications must be met with as they arise. In all ordinary cases this treatment will suffice to save the child from blindness. The same treatment holds good in gonorrheal ophthalmia of the adult type, but must be more rigorous. My best advice to the general practitioner is to refer such cases to the care of the ophthalmologist whenever and wherever an ophthalmologist is available.

As to the treatment of the syphilitic conditions of the eye, let me say briefly that we must use both local and general measures. In some of the chronic conditions constitutional treatment alone is required. In the acute inflammatory conditions, such as iritis, the general treatment consists in the administration of mercury.

The best method to administer this drug is by inunction. One drachm of the mercurial ointment may be rubbed into the skin twice daily, choosing different parts of the body at each application. The local treatment is the same as in all other acute inflammatory conditions of the eye. The use of mercury by the hypodermic needle is in my estimation a useless surgical procedure, having nothing in its favor, and may when long continued give rise to abscesses. In the chronic form the iodides are most useful, and they are best administered in the form of a saturated solution. Where these drugs are indicated they should be given in large and ascending doses, beginning with 15 drops three times daily and ascending to 50 drops if necessary until its physiological effect is manifested. Small doses have little if any value. Should the symptoms of iodism manifest themselves the dose may be reduced or the drug discontinued for a few days. It is well to give the patient a tonic during the administration of this drug, and special care should be taken of his gastrointestinal tract, so that digestion and assimilation be not disturbed. The syphilitic ocular conditions as a rule yield well to treatment. In many conditions, however, the acuity of vision is markedly reduced, and even blindness results despite the most conscientious endeavor on the part of the physician, so that while the social evil exists some people will have to attribute their blindness to syphilis.

TUBERCLE BACILLI PRODUCTS IN THE TREATMENT OF TUBERCULOUS LESIONS.

BY G. R. POGUE, M.D., GREELEY, COLORADO.

Since the discovery of the specific microbic origin of tuberculosis by Koch in 1882, various investigators have endeavored to find some feasible remedy for the disease that counts its victims by hundreds of thousands annually. Koch was the first to bring before the medical world anything that looked at all rational in this line. When he announced to the world his discovery of tuberculin in 1891—not as a cure for consumption, but as useful in lupus and some early stages of tuberculosis—the medical profession hailed the new drug as a cure-all, and men vied with each other to show what remarkable results could be had from its use. Tuberculin was then a crude drug; its composition, physiological and therapeutic properties were unknown, and the dosage was regulated by the fancy of the user. Also the cases thus treated were of the advanced class of pulmonary tuberculosis, and many of them had grave complications or mixed infection.

Kruse in his review of the literature of tuberculin up to 1900 shows the varied ideas held by many of his colleagues, and the fallacy of expecting favorable results in the class of cases reported. He also recites several reported cases showing the dose to have been from 2 to 50 milligrammes, and this amount was often repeated, with no reference to the condition of the patient, with the production of stormy reactions or increasing existing complications. No system already overburdened with toxins and the products of retrograde metabolism could long withstand such additional poisoning. The result of the use of tuberculin in this manner during the earlier years was that the drug soon fell into disrepute, and by the great majority of the medical profession was considered a failure.

Some few workers who had observed favorable results from the use of tuberculin in certain cases of tuberculosis, and who from their knowledge of the pathology of the disease saw greater possibilities in the field of tuberculin therapy, continued to experiment with the drug and other tubercle bacilli preparations. Foremost in this work were such men as Koch, Petruschky, Klebs,

Spengler, V. Behring, Wassermann, and Wright in Europe; Trudeau, Baldwin, and V. Ruck in America. Even to-day while these investigators, whose standing in the medical profession must give weight to their opinions, have shown that tubercle bacilli preparations, properly administered in selected cases, are a very valuable adjunct in the treatment of tuberculosis, only a small percentage of the medical profession is at all familiar with their work, and the majority still hold the same opinions that they formed of tuberculin a dozen years ago.

There has been much theorizing in regard to the physiological action of tuberculin and tubercle bacilli products. "Since the first publication by Koch, on the action of tuberculin on tuberculous tissue, one symptom-complex *has been* especially prominent, viz., *the specific action.* It was certainly something novel that an infectious focus of disease should react specifically to the metabolic products of the exciting microörganism, even when administered in such minute quantities which would not produce any appreciable effect in an organism free from infection. This phenomenon, which was shown for the first time with tuberculin, was later observed in all tubercle bacillus preparations, in so far as these possessed a generally recognized effect on the tuberculous organism. The specificity of this reaction proved to be so valid that its diagnostic application gained more and more ground in human as well as veterinary practice, and to-day tuberculin is widely employed as a *certain* means of diagnosis in doubtful cases of tuberculosis. Not only for diagnosis but also as a therapeutic measure, we attach the highest importance to the specific reaction of the tuberculous focus, and in this respect the local reaction is far more important than the general reaction as expressed by increased temperature" (Wassermann). The chief and most important reaction is therefore the local congestive reaction around the tuberculous tissue.

This local congestive reaction is easily demonstrated in visible tuberculosis, as of the larynx, iris, mucous membrane, and skin, and is observed some few hours after the administration of small doses of tuberculin or other tubercle bacillus preparations. This local hyperemia or flooding of the diseased focus is similar to Bier's method of passive congestion in treating localized infections. The added blood supply also aids greatly in the formation of new tissue around the tubercle, thus more effectually completing the walling-in process. "If the tubercle is successfully isolated by fibrous encapsulation, there arises no consequence of moment to the organism, but if the attempt to wall it off be insufficient, the bacilli multiply rapidly and some migrate radially into the surrounding tissue, spreading infection on every side" (Cornet). It would therefore appear that the local specific action of tubercle bacillus preparations on the tuberculous tissue was to aid the already present forces in thickening the capsule and in that way prevent breaking down of the tubercle during the process of liquefaction and absorption or calcification. This has been shown to be particularly true when the dose is small and not too often repeated at short intervals. By the small properly interspaced doses we get an intermittent hyperemia of the milder form, while with the larger doses frequently repeated the hyperemia is more extensive and continuous. This latter condition tends to soften and break down the new granulating tissue which makes up the capsule, thus liberating the imprisoned bacilli and defeating the object we seek.

As an explanation of the specific local reaction of tubercle bacillus preparations on the tuberculous focus Wassermann and Bruck[5] have shown by a series of unobjectionable experiments conducted at the Institute for Infectious Diseases at Berlin that there is present in the tuberculous tissue or organs an antibody to tubercle bacilli preparations. They also demonstrated that such antibodies *do not* exist in the other tissues or organs of a tuberculous individual who *has not* been treated specifically. They further demonstrated that owing to

the great avidity of these antibodies, situated solely in the tuberculous tissue or focus, for their antigen (the T. B. preparations) they were capable of drawing from the blood such preparations in the greatest possible dilutions (1 in 5,000,000) and neutralizing them within the tuberculous focus. This concentration of T. B. products around the infected focus causes a dilatation of the blood-vessels of the immediate vicinity, together with a gathering of the leucocytes, thus bathing the parts in an excess of the body juices, stimulating cell proliferation and the formation of new connective tissue.

It seemed quite natural to suppose that the amount of "antituberculin" in the tuberculous organs or tissue is limited and would only neutralize a given amount of the "tuberculin." As is stated above, no antituberculin could be demonstrated in the blood or non-tuberculous tissues of a tuberculous animal *not* specifically treated. Neither were antibodies produced in such non-tuberculous tissues of tuberculous animals when the quantity of tuberculin was so graduated that no systemic specific reaction was produced. Such experiments demonstrated that when the amount of the antigen (T. R.) injected was greater than would be neutralized by the antibodies present in the tuberculous tissue, an excess of the antigen remained free and uncombined in the circulating fluids of the body, there to produce (according to Ehrlich's theory) free antibodies in the blood. Such free antibodies would neutralize or combine with the next injection of tuberculin (the antigen) and little or none would reach the tuberculous tissue, thus preventing a local or systemic specific reaction. Unscrupulous dealers in cattle have in this way immunized tuberculous animals by large doses of tuberculin previous to inspection. These immunized animals would then not react to the tuberculin test, and were passed by the inspectors, but later their tuberculosis developed, and it was thought that they contracted the disease in their new surroundings.

Tuberculous persons treated with gradually increasing doses of tuberculin soon become immunized to T. R. and cease to show any specific reaction. Such immunization has no particular effect on the living tubercle bacilli or the progress of the disease, as has been demonstrated by numerous observers.

Smaller doses that cause no systemic reaction and only a mild local reaction, and where the tuberculin injected is all neutralized by the antibodies, situated solely within the tuberculous tissue or focus, have only the local effect of producing hyperemia around the tuberculous focus.

Tubercle bacilli preparations, especially endotoxins, have another specific action. A. E. Wright, of London, demonstrated that when small doses of such T. B. preparations were injected into tuberculous persons there was produced in the serum of such persons a substance that had a certain action on the tubercle bacilli which so modified them that they were more easily and rapidly taken up and destroyed by the leucocytes. Such specific substances he termed opsonins. Wright and his co-workers have formulated a scheme whereby they are able to measure the opsonic power of the blood of persons ill with or convalescing from infectious diseases. This measurement of opsonins is known as Wright's opsonic index. Wright's theory is based on the fact that certain bacteria when treated by the serum of healthy persons are taken up and destroyed by leucocytes at a certain ratio. This ratio is termed the normal opsonic index.[1] From this standard the serum of infected persons is measured, and may be above or below normal. With reference to tuberculosis it is known as the tuberculo-opsonic index. In examining the serum of persons suffering from tuberculosis, it was found to be in the great majority of cases far below normal.

From numerous experiments Wright found that the opsonic power of the blood of these tuberculous persons could be raised by the administration of small doses of tubercle bacilli toxins (0.001 to 0.005 mg.). For one or two days the opsonic index was

lowered (negative phase), after which it began to rise (positive phase) even to double or treble the normal (2.). This fall and rise is spoken of as the ebb and flow of Wright. It is after the index has reached its height and begins to decline that the toxin is again administered, thus restimulating the production of an increase in opsonins. The average time between doses is seven to twelve days, and the inoculations are governed by the opsonic index and therefore properly interspaced. Wright also demonstrated that larger doses of T. B. toxins so depressed the opsonic index that during the ebb the index would not return to normal, here again showing the detrimental effects of large doses of T. B. products on the tuberculous individual.

That the opsonic power of the serum is not bactericidal is shown by the fact that tubercle bacilli treated with a serum of high opsonic power will live and multiply in such serum, but on the addition of washed leucocytes the bacilli are rapidly taken up and destroyed by the leucocytes. That the opsonins have a direct action on the bacilli and not the leucocytes is shown by the following experiments: Washed leucocytes treated by + opsonic serum and then washed do not take up more bacilli than when treated in the same manner by normal serum. Bacilli treated with + opsonic serum and then washed are more rapidly taken up by the leucocytes than when treated by normal. This shows that the opsonins have a direct specific action on the bacilli.

The therapeutic value of Wright's vaccine is now easily understood. In localized ulcerating or open tuberculosis a greater or less number of tubercle bacilli are free in the tissues and are ready to be carried to new territory by the blood or lymph stream, there to set up new foci of disease. With a low opsonic power of the serum few of these bacilli are destroyed by the leucocytes. By increasing the opsonins to a high standard the bacilli are so changed or weakened that they are attacked and destroyed by the leucocytes. Wright[2] reports several cases treated by these small doses of T. B. toxin, which had existed for some time and had previously resisted all other lines of treatment, including in some cases increasing doses of tuberculin. The results were certainly good, much better than had been previously reported in similar cases from any line of treatment. Such investigators as Douglass, Bullock,[3] Harris, and others have reported similar results from the same line of treatment in similar cases.

What further investigations in this line may bring forth no one can predict. There has been much claimed for antituberculous serum, but from our knowledge of the pathology of tuberculosis we cannot expect much from such a serum even though we did possess one of the greatest potency. In the early or milder cases (closed tuberculosis) the bacilli are walled in by a nonvascular fibrous capsule, and are safe from the influence of any substance introduced into the system or circulation. Such a tuberculolytic serum would, however, prove very useful following the rupture of a focus into the tissues or blood stream, or in the case of aspiration pneumonia following the rupture of a focus into a bronchus —that is, if we could recognize such accidents before the escaped bacilli had become localized and protected by partial or complete encapsulation. In a given case of tuberculosis the myriads of tubercles are of all grades and ages, and there is no way of foretelling when one or more may rupture.

From our present knowledge of the specific treatment of tuberculosis the procedure becomes narrowed down to two propositions, viz., first in aiding in the thickening of the capsule around the already imprisoned bacilli, by means of localized congestion, intermittent and of short duration (local specific reaction); secondly, by increasing the opsonic power of the blood, thus preparing any free bacilli for destruction by the leucocytes. If the free bacilli can be kept under control and prevented from forming new foci of disease the permanent arrest of the encapsulated bacilli would not appear so difficult.

My experience with *tubercle bacilli preparations* in the treatment of tuberculosis during the last six years is based on the review of 253 cases; 176 have already been reported.[4] The most noticeable feature about the arrested cases is the very few relapses that have occurred up to the present time, and those that did relapse generally disobeyed all instructions given them. There has also been an apparent permanent arrest of the disease in the early cases, a discussion of which I do not purpose to enter upon at the present time.

In treating these cases specifically I used antiphthisin (Klebs), which is claimed by the manufacturer to be a purified tuberculin free from the tubercle bacillus endotoxins. This preparation has been used when it was desirous of producing only the local reaction, in doses of .01 to .5 milligramme. Recently I have used the pure toxin or endotoxin, obtained from the tubercle bacillus, free from culture medium or metabolic products, in the treatment of open tuberculosis for the purpose of increasing the opsonic power of the blood. It is too early to pass an opinion on the results, but up to the present they have been very satisfactory.

1. Hektoen: *Journal A. M. A.*, May 12, 1906.
2. London *Lancet*, Dec. 2 and 19, 1905.
3. *Practitioner*, November, 1905.
4. *Medical Record*, Aug. 4, 1906.
5. Wassermann and Bruck: *Deutsche med. Woch.*, vol. 32, No. 22.

EXAMINATION OF THE FECES.[1]

BY GEORGE H. JONES, M.D., TOLEDO, OHIO.

Examination of the intestinal dejecta is unfortunately often neglected, and compared to the thoroughness and routine with which other materials are investigated it must be acknowledged that the feces receive but slight consideration. The chief causes of this indifference are quite clear to those who have given the matter much thought. In the first place there is the disagreeable nature of the material and its unpleasant odor; to this must be added the difficulty in transportation, and the lack of exact clinical data resulting from a single examination. These objections, it must be admitted, are somewhat justifiable, but the same could with equal right be made against other secretions and excretions, which are habitually examined, without a thought of the unpleasantness of the task. Aside from those who give intestinal diseases their special study few physicians make systematic and repeated examinations of the feces of their patients. Nevertheless this work is extremely important in the diagnosis and pathology of diseases of the intestines, and often furnishes the only means for the formation of an opinion as to the nature of the condition. By this it should not be understood that the large majority of practitioners fail to consider the evidences of disease to be found in the feces. On the contrary, careful inquiry is usually made of the patient or nurse as to the consistence of the stools, and the presence of blood, mucus, pus, etc. Too often the reply is accepted without question and becomes a part of the diagnostic scheme. It is here that the mistake is made, and it must be emphatically said that these examinations are not satisfactorily made by individuals who have had no training in this work. Examinations of the feces in gastrointestinal disease is as important as that of the urine in diseases of the kidney, and it cannot be too strongly urged that careful examination of the dejecta should be made with the naked eye and the microscope as a routine procedure in the investigation of all cases of gastrointestinal disorder. Chemical examination, too, will often give considerable information, but as a rule it furnishes less than the two methods just men-

[1]Read before the Toledo Microscopical Society at its regular meeting, January 9, 1907.

tioned, and aside from the tests for blood gives little clinical data.

MACROSCOPICAL EXAMINATIONS.

The macroscopical examination of the feces consists of an investigation of: (1) Form and consistence. (2) Color. (3) Odor and quantity. (4) Abnormal ingredients, such as mucus, pus, blood, parasites, and concretions.

This examination alone is often sufficient to enable an experienced observer to form a judgment of the case. The technique is simple, and ordinarily no special preparation is necessary, except in a search for gall-stones, the head of a tapeworm, or intestinal parasites, when the feces should be washed through a fine sieve. For this purpose the stool sieve described by the writer will be found serviceable and inexpensive, and greatly simplifies the examination for these materials.

1. *Form and Consistence.*—Normally the stool is cylindrical and of a somewhat uniform caliber. In adults it is always formed, while in infants it is quite soft and pasty. Delayed peristalsis resulting in a prolonged stay in the colon causes a large part of the water to be absorbed, resulting in an extremely hard fecal mass; this may become broken into small round masses called scybala. If, on the other hand, peristaltic action is unusually rapid, the feces are hurried through the intestinal canal without sufficient time for the absorption of water, producing dejecta of a soft or semifluid consistence. When not due to cathartics or diet, such stools are pathological, and it is often extremely difficult to determine whether the increase of fluid is due to exudation or transudation from the mucous membrane, or to deficient absorption. It is here that microscopic examination offers additional data.

2. *Color of the Stools.*—(*a*) Dark brown is the usual color in health, due mainly to the presence of hydrobilirubin, but foods have an influence on the color and considerable variations may occur. Thus, certain foods of decided color, such as blackberries, whortleberries, red wines, etc., impart their color to the stools, while meat diet causes dark and vegetable diet yellowish discharges. Various drugs also influence the color, and among these may be mentioned bismuth, iron, manganese, rhubarb, senna, santonin, kino, and hematoxylon. (*b*) Clay-colored stools are usually indicative of a deficient amount of coloring matter in the intestines, which may be due either to some obstruction of the common bile-duct, or to a diminished formation of bile. It should not be forgotten, however, that such stools often occur when there is no evidence of these conditions, and in such cases the clay-colored stool is due either to the presence of an excessive amount of fat, or to bilirubin having been reduced beyond the stage of hydrobilirubin to a colorless body, leucohydrobilirubin. (*c*) Green stools may be caused by the presence of a color-forming bacterium in the intestine or to the food; the most frequent cause is the presence of biliverdin. In adults green stools are but occasionally seen, and accompany some increase in the peristaltic action of the intestines. This may be due to diarrhea, but is most frequently observed after the administration of a cathartic, such as calomel; this causes the bile to be swept out before it undergoes the usual changes. (*d*) Tarry or black stools, when not due to drugs or diet, usually occur after a leakage of blood into the intestinal canal.

3. *Odor and Quantity.*—The odor of the adult stool is due mainly to the products of proteid decomposition, and is therefore greater in the case of a meat diet or when the fecal matter has remained for some time in the intestines. On the other hand, feces hurried through the canal have little time for decomposition, and hence have little odor. The quantity of the feces varies with the quantity and nature of the food. Vegetables increase the amount because of the large percentage of indigestible material contained in them. The amount of the evacuation does not, however, depend entirely upon the food taken, for it has been estimated that intestinal débris may amount to one-sixth of the total quantity of feces. Intestinal bacteria, too, furnish

in health one-third of the feces, and in diseases favoring the growth of bacteria this may be doubled. An increase in the daily amount of the feces is also observed when there is deficient digestive juices, diminished absorption, or increased peristaltic action.

4. *Abnormal Ingredients.*—(*a*) Mucus. In the normal stools of adults no trace of mucus can be found macroscopically, and with the exception of that seen in mucous colitis, and on hard fecal masses which have remained some time in the colon, mucus in the feces is an evidence of intestinal catarrh. The converse is not true, however, for the absence of mucus in no way excludes the existence of a catarrhal condition. When voided pure, thick, and glistening, or as a thick coating on the feces, it points to disease of the rectum or large intestine. If in smaller quantity and thoroughly diffused through the fecal matter, it indicates that the small intestine is involved; the finer the division of the mucus and the more pronounced its discoloration from bilirubin, the higher is the seat of the disease. (*b*) Pus may appear with the dejections, and when present in large amounts is easily recognized by the naked eye. When passed pure it comes from the lower bowel and is an indication of the rupture of an abscess. (*c*) Blood when found in the stool is always of pathological significance. As a rule bright-red blood comes from the lower part of the bowel, while that which is of a tarry or coffee-ground appearance is more apt to have its origin from the upper part of the digestive tract. (*d*) Parasites. The *Ascaris lumbricoides,* or roundworm, is the most common human parasite, and is often found in the stools of children. It is cylindrical, from three to twelve inches in length, of brownish-red or yellow color, and has considerable motility. The *Oxyuris vermicularis,* or threadworm, is also frequently found in the stools of children. It is of a white, threadlike appearance, and varies from one-sixth to two-fifths of an inch in length. Two varieties of tapeworm are found in this country, parts of which may be passed with the feces. One, the *Tænia saginata,* or beef tapeworm, is the most common. This consists of the head, which has suckers but no hooklets, the neck, and many segments, which gradually increase in size from the head downward. The total length of the worm varies from twelve to twenty feet. The other variety is the *Tænia solium,* or pork tapeworm, which is provided with hooklets as well as suckers on the head; its individual segments are shorter and narrower than the beef worm, and the total length is less (10 to 12 feet). With these exceptions it is similar in appearance to the *Tænia saginata.* (*e*) Concretions are of several varieties, and are either biliary, pancreatic, or fecal. Of these the most important are the gall-stones. There are friable, reddish-brown, or whitish masses, varying in size from a millet seed to a pigeon's egg, and either smooth or faceted, depending on the number in the gall-bladder when the stone was formed. On section a dark nucleus is usually seen surrounded by cholesterin. Gall-stones composed of cholesterin float on water, while those made up of inspissated bile or calcareous salts are heavier and will sink.

MICROSCOPICAL EXAMINATION.

Microscopical examination of the feces requires a semifluid material, which may be obtained by mixing a small amount of water or normal salt solution with the stools. If offensive a two- to four-per-cent solution of formaldehyde or a solution of thymol may be added, after which a drop or two is placed on a slide and covered with a cover-glass. The examination for special elements is facilitated by allowing the fluid material to settle, when it will be found that the heavier muscle and vegetable fibers are at the bottom, parasite eggs in the middle, and bacteria, fatty acid crystals, and light cellulose materials are in the upper layers. The examination consists of a search for: (1) Food particles. (2) Parasites, ova, and microörganisms. (3) Blood cells, pus, epithelia, and mucus. (4)

Crystalline elements. (5) Fragments of intestinal mucosa or neoplasms.

1. *Food Particles.*—(*a*) Muscle fibers occur in all normal stools. They appear as yellowish cylindrical masses rarely showing any striation, and their presence even in large numbers is of little diagnostic value unless the increase is constant. Nothnagel's carefully constructed law is as follows: "If we find an abnormally large amount of muscle fibers in the feces with definite symptoms of intestinal catarrh (as shown by the presence of mucus), and an absence of fever, it is justifiable to conclude that catarrh of the small intestine is present." (*b*) Elastic and connective tissue are also found in the stools, but have no diagnostic significance. (*c*) Free starch granules are practically never found in normal stools, and their presence even in moderate amount is always pathological. On the other hand, starch masses enclosed in cellulose membranes are frequently seen. Unaltered starch granules are found in diarrheal conditions, in cases of hyperacidity of the stomach, and when there is a lowered activity of the pancreatic ferments. Starch is best recognized by the characteristic blue color which it assumes when treated with a weak iodine solution. (*d*) Fat appears in the feces in the form of globules and crystals. Fat globules are recognized as round refractile bodies which are stained black by osmic acid or red by Soudan III. Fat crystals are either fatty acids or fatty soaps. Fatty acids are short, slender needles, soluble in ether, which melt into globules when heat is applied to the slide. Fatty soaps also occur as needles, but are coarser than the former, are insoluble in ether, and do not melt when heat is applied. Both fatty acids and soaps take the fat stains, but the color is not so deep as in the fat globules. Fat regularly appears in normal stools, and depends upon the quantity ingested. Abnormal amounts are observed in biliary obstruction, pancreatic disease, or any condition associated with increased peristalsis. (*e*) Masses of coagulated albumin or casein are frequently found in the feces of those who have partaken of large quantities of milk or eggs. Pieces of casein stained with bile and containing globules or fatty acids are often seen in the stools of infants suffering from intestinal indigestion.

2. *Parasites, Ova, and Microörganisms.*—Parasites: Amœba Dysenteriæ. The examination for ameba should be made from a perfectly fresh stool, for the parasite easily loses its ameboid motion, which is its most characteristic point. A blood-streaked particle of mucus should be selected, placed on a warm slide, and covered. Under a low power of the microscope the organism will be found to be made up of a nucleus surrounded by a coarsely granular mass of protoplasm, which contains vacuoles and often red blood-corpuscles. The size of the ameba varies considerably, and has little if any relation to its pathogenicity. At rest it is round or oval in shape, but when in motion the parasite extends one or more arm-like prolongations called "pseudopods," and its protoplasm follows. Unless this ameboid motion can be detected a differentiation between the parasite and degenerated cells is difficult. The causal connection between amebas and intestinal infections has never been fully settled, but it is most probable that the ameba is a secondary and not the primary agent in the infection.

Ova: (*a*) The eggs of the *Ascaris lumbricoides* are oval, protected by a transparent shell, and outside of this is an albuminous envelope. When passed in the feces the egg shows no embryo, but only a mass of yellowish granular protoplasm. (*b*) Eggs of the *Oxyuris vermicularis* are oval and have a chitinous shell. In the feces they appear either as masses of fine granular protoplasm with a small nucleus, or in the various degrees of embryological development. (*c*) The eggs of the *Tænia solium* and *Tænia saginata* are indistinguishable. They are oval, with a thin shell. The embryo has a rudimentary scolex with six hooklets. Its shell is thick and radially striated. (*d*) Enormous

quantities of eggs are found in the stools of those suffering from uncinaria americana. The eggs of the hookworm are elliptical, with a transparent shell, and frequently present various stages of segmentation.

Microörganisms: One of the most important pathogenic microörganisms found in the feces upon microscopic examination is the tubercle bacillus. The technique of its demonstration is the same as that for sputum examinations. The method is, however, of limited value, and the diagnosis of intestinal tuberculosis should never be made unless there is an entire absence of sputum and the tubercle bacilli are constantly found in thin, watery stools.

3. *Blood Cells, Pus, Epithelia, and Mucus.*—Red blood cells are quickly destroyed by the intestinal secretions, and when found are usually from the large intestine or rectum. If disease of the rectum can be excluded, the presence of red blood cells in the feces may indicate dysentery, ulcer, intestinal tumor, or obstruction. White blood cells appear normally in the stools in small numbers, and in acute or chronic catarrhal conditions of the bowel they are considerably increased. Eosinophiles are found in the stools of persons suffering from intestinal worms, or mucomembranous colitis. Epithelia are constantly found in the feces, but usually are so affected by digestion that special care is necessary to identify them. Cylindrical epithelia are the most important, and are frequently so altered that all stages from normal to degeneration may be seen. Epithelial cells are very prominent in all inflammatory diseases of the intestine and best studied in fresh mucus. Large numbers of cylindrical epithelia embedded in mucus are usually found in catarrhs, while on the other hand mucus without epithelia indicates that the condition is a neurotic and not an inflammatory one. Mucus appears as transparent, slightly striated masses. Often epithelia, leucocytes, blood cells, or food remnants are found embedded in the mucus, and in such cases its origin has probably been high up in the intestine.

4. *Crystalline Elements.*—A variety of organic and inorganic crystals occur in the feces. They have no diagnostic significance. Triple phosphates and calcium oxalate crystals are the same as those seen in the urine. Calcium phosphate occurs as small wedge-shaped crystals radiating from a common center. Cholesterin crystals are not common, but are sometimes found in the stools of infants. They are recognized by their rhombic form, and when treated with sulphuric acid become a deep red. Charcot-Leyden crystals are identical with those seen in the sputum, and are frequently found in the dejecta of persons harboring intestinal worms. They are colorless, octahedral bodies with sharp margins, and somewhat resemble fatty acid crystals, but are distinguished from these by their solubility in hydrochloric acid and insolubility in alcohol or ether.

5. *Fragments of Intestinal Tissue or Neoplasms.*—Necrotic tissue from inflammatory conditions involving the intestinal wall sometimes appears in the feces. Polypi, the sloughs from invaginated bowel or from tumors, are also occasionally found. Although the preceding description of the examination of the feces is less exhaustive than the subject deserves, enough has been given to clearly show the diagnostic value of such examinations. No close student of the manifestations of disease can afford to neglect this valuable means of investigating the secretive, absorptive, and motor functions of the stomach and intestines. Schmidt and Strassburger, Nothnagel, Boas, and other pioneer workers in this field have pointed out the vast clinical data which may be obtained from such examinations, but much work remains to be done. Little by little this will be accomplished by contributions from the great army of practitioners who have learned the value of regular and systematic examination of the feces.

THE TREATMENT OF INTERNAL HEMORRHAGES.

BY G. WERLEY, M.D., EL PASO, TEXAS.

I have no specific for hemorrhage. The treatment of internal hemorrhage is very unsatisfactory.

In the management of hemorrhage we have but one object, and that is to secure the formation of a clot in the bleeding vessel. Let us then review a few facts. It is well established that the soluble salts of calcium are essential to the formation of the blood clot. When these salts are precipitated out of the blood by potassium oxalate, coagulation will not take place; but if calcium chloride is again added, clotting will promptly follow. When these salts are deficient, as in habitual nose-bleed, I have many times seen the chloride of calcium give prompt relief.

The clotting of blood in the vessels is favored by slowing the blood current. The blood current at the bleeding point may be reduced by lowering the general blood-pressure. In some cases, as in bleeding from the intestines or brain, the blood may be diverted to other parts of the body, thus reducing the pressure and slowing the current in the bleeding vessel. Mechanical rest of the bleeding point is also necessary to prevent detachment of the clot.

The treatment of cerebral hemorrhage is well established and is in accordance with the principles just stated. So far as I know, no one would think of giving adrenalin or styptics in apoplexy. Why then give them in pulmonary hemorrhage?

True, in bleeding from the lungs the conditions are somewhat different. In the first place the blood stream cannot be diverted to other channels, for all the blood must pass through the lungs in its circuit of the body. On the other hand, the normal pressure in the lungs is only one-seventh or one-eighth of that in the systemic circulation. Another fact of great importance is that the blood-vessels of the lungs are very poorly or not at all supplied with vasomotor nerves. Arterial pressure in the lungs is not regulated independently, but varies with that in the systemic circulation. Plainly, then, the giving of adrenalin, ergot, or other vasomotor stimulants is most irrational in pulmonary hemorrhage; for such treatment can have but one effect, and that is to raise the pressure and increase the rate of flow in the bleeding vessels of the lung.

There is one condition, however, in which cardiac and vasomotor stimulants may do good. When the left heart is crippled from valvular defects or otherwise, resulting in back pressure in the lungs, heart stimulants will lower the vascular tension in the lesser circulation and thus aid in stopping pulmonary hemorrhage. Bleeding from the arm is also a rational procedure under these conditions.

When the heart is normal, treatment should be directed to lowering the blood-pressure and slowing the current. Rest in bed will quiet the heart and reduce the pulse-rate. Among drugs, morphine (without atropine) will do the most good, by quieting the patient and lowering vascular tension; for fright and anxiety are most potent causes of high blood-pressure (Francis Hare). Aconite, chloral hydrate, and nitroglycerin or amyl nitrite are indicated for similar reasons. Francis Hare has found amyl nitrite to stop pulmonary hemorrhage almost instantly in nearly every case. One should not forget, in case the hemorrhage persists, to give either the chloride or lactate of calcium to increase the coagulating power of the blood, which may be deficient. Two or three drachms should be given in the course of a few hours, and then its use should be discontinued. These drugs produce prompt results when the proper indication exists. Styptics and astringents, such as gallic acid, tannic acid, sulphuric acid, and the like, cannot possibly reach the bleeding point in sufficient concentration to be of any service.

Now as to intestinal hemorrhage. Here the conditions are again different. The blood-vessels of the intestines contract very actively under stimulation of the splanchnic nerves. The portal veins are also supplied with vasomotor nerves (Howell). In fact, according to Howell, the splanchnic nerve "plays a predominating part in the maintenance of normal blood-pressure." This is important, for by actively stimulating the vessels of this area the blood current may be diverted to other channels. According to the experimental results of W. E. Dixon, of London, ergot, digitalis, strophanthus, barium, and lead each cause contraction of the arterioles, especially in the splanchnic area. According to Pal, the salts of lead have a special, selective action for the blood-vessels of the intestines, like that of ergot for the uterus. He considers lead colic to be due to the irritation and contraction of the vessels in the intestinal walls.

The recent experiments of Dr. Fenton B. Turck demonstrate that water at 120° F. in the colon causes marked contraction of the blood-vessels controlled by the splanchnic nerves, at the same time dilating the peripheral circulation. He has also shown that placing the feet in hot water has the same effect. If Dr. Turck's conclusions are correct, hot-water enemas and hot foot baths almost ideally meet the conditions to stop intestinal hemorrhage. In view of the foregoing facts we may sum up the treatment of intestinal hemorrhage as follows: (1) Absolute rest. (2) Withdrawal of food and the giving of opium to quiet intestinal peristalsis. (3) Lead acetate, five grains every hour, to contract the intestinal blood-vessels. There is no objection to giving ergot, and Pepper thought it the best remedy. (4) Hot foot baths and hot saline enemas for the reasons above indicated. (5) The soluble salts of calcium may be given to hasten the clotting of the blood. (6) Local astringents, such as tannic acid and subsulphate of iron, may be given with a very slight hope of their reaching the bleeding point; but the results of their direct application in nosebleed is often so disappointing that one cannot give these drugs in intestinal hemorrhage with much confidence.

TREATMENT OF LOCAL INFECTIONS.[1]

BY HENRY S. WIEDER, M.D.,

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The subject of this communication has probably appealed to many as extremely commonplace, since it is one with which every practitioner has considerable experience in the course of a year. A rather large dispensary practice in addition to private work for the last few years, during which time there has been ample opportunity to study the various methods of treatment used by different men, has convinced me that a few profitable moments can be spent in discussing this subject in an effort to arrive at some conclusion as to what method is best adapted to the majority of cases. In the following remarks I make no claim of originality, but I have simply tried to sum up the results of a rather large and successful experience with the subjects treated.

The first subject to be considered is what may be called the "poultice" cases—that is, those cases in which the laity always and some of the profession often apply the flaxseed or the milk poultice. This class is placed first because it represents the initial stage of all infections and because there is the greatest diversity of opinion as to how it should be handled.

For the purpose of discussion, let us consider the typical case that is seen so often, viz., the neglected scratch on the finger or hand or the furuncle on the wrist, before the stage of suppuration. When the patient is first seen he has a

[1]Read before the North Branch of the County Medical Society of Philadelphia, Sept. 18, 1906.

swollen, edematous member, hot and tender, with marked induration all around what may be the remains of an abrasion or slight wound or infected hair follicle. The patient complains of throbbing pain with loss of sleep, and shows considerable anxiety for fear of "blood poison." Palpation always causes pain, which is especially located at the point of infection.

From the throbbing character of the pain and the general appearance of the lesion we know that we have an infection which will not go on to resolution without appropriate treatment, but which will spread to the neighboring glands and structures, and if unchecked may become general. What is the appropriate treatment? Shall we poultice it and wait until it shows the green head of "pointing," or more probably has spread into the glands of the axilla? Shall we apply ichthyol or antiphlogistine and wait? Shall we dress it in lead-water and laudanum and wait?

Personally I rarely if ever resort to any of the above plans. I cannot understand where there can be any advantage in placing moist warmth, in the form of a dirty poultice, over an infected area to cause an increased destruction of tissue by giving the bacteria present a favorable temperature for growth in an already favorable medium. It may be true that, in a moderate degree, local leucocytosis is promoted, but I do not believe that this result is attained so much by the heat as by the increased amount of toxin that is formed as the results of the increased growth of the bacteria. Again, the process is a very painful and very slow one. Still worse is the fact that this moist heat promotes the growth of the bacteria that may be present in the hair follicles in the neighborhood, so that it tends to promote the formation of other furuncles or points of infection in the same region. Finally, should the infection point and discharge, the poultice is not absorbable or antiseptic, so that the pus is spread over all the surrounding skin, infecting all the follicles in the same region. This infection may lie dormant for some time, but every one knows how common it is to have the formation of other furuncles or infections in the same region, especially in poulticed cases. Examples of this are very frequent on the back of the neck and the wrist.

Ichthyol and antiphlogistine are preferable to poulticing, but they also are lacking in the essential feature in that they make no effort to destroy the nidus of infection, neither being germicidal in their actions nor reaching the nidus were they so. In some few cases of infection of a minor degree of slow development and little pain I have, through timidity or lack of sufficient intelligence on the part of the patient, been tempted to use the above remedies, but never with much success.

The method that has given the best results is as follows: In cases, as the one stated above, in which no fluctuation can be detected, but in which there is the remains of a wound or a point of especial tenderness, after the usual cleansing, a rather small incision is made over the point of greatest tenderness deep enough to allow free bleeding and to reach, if possible, the focus of infection. It matters little if pus is found or not. After allowing the wound to bleed freely for a time to flush out the infected blood that may be in the tissues, the entire wound is freely carbolized with pure carbolic acid, then packed and covered with a wet bichloride dressing. C. B. Longenecker in the *Pennsylvania Medical Journal* for May, 1905, recommended sterilization with camphophenol (camphor 2 parts, phenol 1 part), and packing with gauze saturated with the same solution, but I have had no experience with this remedy in local infections. In addition to dressing the wound as described above, the patient is given a prescription for bichloride tablets which he is told to use, one to a quart of as hot water as can possibly be borne, soaking his bandage and all, without removing the dressing, in this hot solution three times daily for one-half hour on each occasion.

There are three reasons for opening these cases so early. By so doing the nidus of infection is often reached and, with the free use of carbolic acid, steril-

ized. The minor inflammation that ensues is the result of the carbolic acid burn, not of infection, and consequently rapidly subsides. It also breaks the non-absorptive area of the skin and opens a small avenue for absorption of the bichloride solution by the softer tissues, thereby succeeding in accomplishing the result desired even when the carbolic acid has failed. Finally, should all of the above means fail to abort the infection and should it go on to suppuration, the incision will greatly reduce the pain suffered during the formation and accumulation of pus by relieving the tension of the unyielding skin and making a point of least resistance for the pointing of the abscess. It gives the infection an opportunity to point before there is much destruction of tissue and injury to the deeper structures.

Having made the incision and carbolized the wound, the patient is instructed to return the following day, on which occasion one of two conditions are found: The inflammation has greatly subsided, also the pain and induration, and on the piece of drainage, if it has remained in, there is a small amount of secretion, but no distinct pus; or the inflammation has continued to spread and there is pus in the wound. Probing reveals a cavity or shows a dense, necrotic, yellowish mass or "core" in the center surrounded on all sides with fluid pus, the cavity having its orifice at the site of the wound made on the previous day.

In the former instance, where there is no formation of pus, the simple application of a wet bichloride dressing for another twenty-four hours will suffice to accomplish a cure. In the latter instance where it has gone on to suppuration, the cavity should be freely laid open, preferably with a scissors, as it is more quickly accomplished than by a knife and does not frighten the patient, because he does not suspect what is going to happen until it is all over. The central slough or nidus is removed with forceps if possible, but simple infected cases or furuncles are never curetted when first opened for fear of opening new avenues for the spread of the infection before the formation of a barrier in the form of a well-developed pyogenic membrane. I do not often cleanse with hydrogen peroxide for fear of distending the tissues and accomplishing the same undesired result. After washing it out with bichloride solution, sometimes the cavity is carbolized and packed, or often is just packed and dressed with a wet bichloride dressing. For packing the wet bichloride gauze selvage has proven the best for drainage and the easiest to handle. Dry iodoform gauze or any other form of dry packing should not be used, for while its capillarity is undoubtedly greater for a time, it allows the pus to "cake" on the surface at the mouth of the abscess cavity, and within several hours another abscess is formed with the gauze packing acting as a cork to hold in the pus. It is because of this fact, which also holds true for the selvage packing unless kept moist, that the patients are given prescriptions for bichloride tablets with instructions for soaking their dressings. If the patients are too young or not sufficiently intelligent to trust them with the bichloride, they are instructed to soak the bandage with hot boiled water instead. It is surprising what relief the patients experience as the result of these baths. It is almost a daily occurrence to have a patient state that he had had pain again in a few hours after treatment until he had soaked his bandage, and then there was instant relief.

The reason for the relief given is easily found, the modus operandi being about as follows: The hot solution loosens up the caked pus at the orifice of the abscess and moistens the wick of gauze so that it again begins to drain and empty the cavity of its pus. In addition to reëstablishing drainage, it acts as if the cavity were being thoroughly syringed with bichloride solution thrice daily and sterilizes whatever bacteria may still be within reach of the solution, so that only sufficient inflammation remains to accomplish the healing of the defect, and is not increased by the remaining bacterial infection. The bichloride soakings also sterilize the pus

that is drained out of the cavity so that it does not become rubbed into the healthy skin surrounding the wound and later develop into other infections. This one fact alone would be sufficient to cause it to displace the old poultice.

At the next dressing, on numerous occasions, a dry cavity has been found on removing the packing, and in any event the amount of pus secreted is less than by any other method that I have seen used in the past. The cavities heal rapidly and painlessly and require less care and changing of dressings than if the dry method is used. I do not believe in wet dressings with waxed paper over them, for while the paper keeps the dressing moist longer than without it, the dressing will eventually dry out, and in the meanwhile the heat of the part has converted it into a moist warm dressing or poultice. This, while preferable to other forms of poultices, is open to the objection to which all poultices are subject.

With reference to the cases where the patients had not been seen during the early stages described above, but only after the infection has pointed, there is little to say in addition to the above. Make sufficiently large incisions and drain as described above.

While I know that it is almost superfluous to call the attention of this gathering to the difference in the gravity of infections of the thumb and little finger as compared with infections of the other fingers, for the sake of completeness I will make brief mention of the fact. The synovial sheaths of the three middle fingers terminate as blind pouches at the metacarpophalangeal joint, whereas the synovial sheaths of the little finger and thumb are continuous, the one with the sheath of the common flexors and the other with the sheath of the flexor longis pollicis. Both of the latter extend above the annular ligament, so that infections of the little finger and thumb that gain entrance to the tendon sheaths, as the tenosynovitic form of panaritium, spread rapidly under the annular ligament and up the arm.

Lymphangitis and phlebitis are not very common complications of cases treated vigorously. Personally I have seen only two of the former and none of the latter during the last three years in a very large number of infections treated. In the event of its occurrence the bichloride drainage of the wound with the application of a large wet bichloride dressing the full length of the infection, accompanied with the soakings prescribed for the original wound, should suffice to cure the infection without further spread. Of course, should additional abscesses form along the course of the vessels, they will have to be treated in the same manner as the original infection.

The mistake must not be made that lymphangitis or phlebitis is necessary to have infection of the neighboring glands, for the infection can travel along lymph and venous channels and be filtered out at the glands without affecting the vessels in the least. This mode of infection to the nearest glands is rather frequent in a minor degree, especially in cases that have been poulticed or which have been opened and are not draining well. It can be easily overcome by free incision or reestablishment of free and continuous drainage at the site of the original infection. Only once have I had to open the axillary glands as the result of an infection lower down, and that case was in condition for opening when first seen.

With reference to panaritium, I will merely mention the various forms and briefly call special attention to two of them. Panaritium is divided into cutaneous, subungual and paraungual, tenosynovitic, osseous, and arthritic. In all the treatment is very free incision and draining at the very earliest possible moment to prevent serious after-effects, even to the extent of death. Friedrich has written a very able article on this subject in V. Bergman's System of Surgery, in which he calls attention to the various serious results that follow procrastination. He also calls attention to the difference in the arrangement of the connective tissue connecting the skin to the fascia in the palm

of the fingers and hand, and in the remainder of the body. Here the connecting fibers are short and arranged vertically, while elsewhere they are longer and unite with the skin and fascia at an acute angle, which allows for greater distention without harmful pressure. This has bearing in the fact that inflammations on the palmar surface spread laterally and deeply, causing necrosis and sloughing much sooner by the increased tension than do similar inflammations on the dorsal aspect. He therefore wisely advises incisions in palmar infections to be made sooner and more extensive than in dorsal infections.

I wish to particularly call attention to tenosynovitic panaritium because of a very instructive case which I encountered. A colored man presented himself with what appeared to be superficial inflammation of the proximal phalanx of the middle finger, with the usual signs of pain, redness, swelling of the finger, etc. I made an incision in the finger, which failed to reveal pus, but which gave instant relief, so that he refused to allow me to go deeper. The wound was dressed in the usual manner, and the next day he told me that he had had perfect relief and had enjoyed a good night's sleep. Examination revealed slight tenderness, but what was more pronounced was the marked increase in the girth of the finger. A knife was introduced into the wound penetrating the tendon sheath, and immediately about a drachm of seropurulent fluid gushed forth. The girth of the finger was promptly reduced to normal, and the case progressed to recovery without further incident. This case emphasizes the fact that the deeper infections can resemble the more superficial ones owing to the tenseness of all inflammations on the palmar surface of the finger and that superficial incisions may give temporary relief without cure because of the release of tension.

Just a few words with reference to paraungual panaritium, or "run around." Upon several occasions, upon my own fingers and fingers of a few of my more intelligent private patients, I have experimented with the Bier method of treatment when the condition had not as yet gone on to pus formation, and invariably with success. I have had only a very limited experience with the method, but thus far none have suppurated. The method used was extremely simple. A rubber band was slid over the finger down on the first phalanx so that it was just tight enough to shut off the venous circulation, leaving the arterial pulsation still to be felt beyond the band. This was allowed to remain on for an hour or two at a time, and was removed for a similar length of time. I once fell asleep with one on, and did not discover it until morning, with no other result than the cure of the panaritium. The finger was allowed to acquire only a dusky reddish hue and never allowed to get pale or blue. The method is so simple that I intend to continue to use it, and will possibly employ it in selected minor infections of the skin before pus formation. It gives quite prompt relief of pain after the first ten or fifteen minutes.

Before taking up the subject of carbuncles I wish merely to comment upon the frequency of the formation of furuncles on the back of the neck and on the wrist, in both of which situations there is both profuse perspiration and dirt, a splendid combination for the promotion of infection of the hair follicles. I believe that the consideration of these two facts gives a good clue to the proper method of preventing the continued recurrence of furuncles at the above sites. Internal medication is of little use. What is much better is to give to those whose occupations predispose them to furunculosis from the above causes prescriptions for bichloride tablets, and let them soak the above mentioned situations with bichloride solution about three times weekly, if not oftener, even after the original infection is cured. This method has been very effectual in my hands.

Carbuncles, wherever located, should be treated in the usual manner of free crossed incisions, curetting thoroughly, breaking down the wall of every sinus, thoroughly carbolizing the interior of the cavity fol-

lowed by alcohol to prevent absorption of the excess, and then draining with continuous wet packing as previously described. Immediate curetting in these cases has not the objections it has in simple infections, for in this condition there is no tendency to localization present, and unless all sinuses are broken down and thoroughly disinfected, the spread will be unlimited.

The above, I believe, include all the more important of the local infections. In conclusion I would summarize as follows:

1. Poultices, so-called antiphlogistics, etc., are useless in the treatment of local infections and do harm by causing greater destruction of tissue and delaying proper remedial measures.

2. Immediate incision over the point of greatest tenderness should always be practiced, followed by carbolization of the wound to destroy the nidus of infection, and then a wet bichloride dressing applied.

3. Free incision with constant wet drainage should be the rule in the presence of pus.

4. Dry drainage, especially when saturated with coagulative powders, is ineffectual and harmful because of the "caking" that occurs on the surface, sealing the cavity.

5. Cases, especially with drainage, should receive soakings with hot bichloride solution thrice daily. Hot salt solution or water may be used if the bichloride appears to be too dangerous.

6. Waxed paper should not be used over wet dressings, as it forms them into moist warm poultices, which are objectionable.

7. Never curette infections primarily, excepting carbuncles, which should always be curetted and carbolized.

8. Gauze selvage, when soaked in bichloride solution, makes a conveniently handled and effectual packing.

9. Palmar infections of the fingers and hands are more serious than dorsal infections.

10. In incising for palmar infections of the fingers, continue the incision until pus or the bone is reached, and do it without delay.

11. The Bier method of treatment appears worthy of further trial, especially in the milder panaritia of the cutaneous or paraungual type.

ASEPTIC OPERATIVE TECHNIQUE.[1]

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Quite a number of hospitals have of course a varying amount of individuality in their methods of technique. Every surgeon who does much work will sooner or later evolve some methods of his own, selecting certain points from the experience of others that may seem good to him, and assembling them after his own fashion, so that in any event he at least owns the string which holds them together. A technique to be satisfactory must be simple, logical, and consistently adhered to. For a successful and harmonious technique in accordance with any plan the instinct of cleanliness should be well developed. Without it the would-be surgeon had best return to pursuits more in keeping with his natural tendencies.

Prior to major operative procedure of any sort I prefer to give the patient a few days at least of preliminary treatment, including a carefully regulated diet, purgatives, and rest in bed. The intestinal tract is in a measure freed of excretory products, intestinal indigestion with its putrefactive and gas-forming concomitants is temporarily held in abeyance, and the individual who may be accustomed to the most active habits becomes habituated to life abed. As the eliminative power of the skin when in a normal state of efficiency is great, considerable attention should be

[1]Read by title before the Mississippi Valley Medical Association, Hot Springs, Ark., Nov. 8, 1906.

bestowed on that organ; skin friction, soap, and a hot tub or shower bath should be given daily for several days, a clean suit of underclothing being put on after each bath. Eczematous conditions of the skin as a rule should be a bar to operative procedure in the affected region. I usually give the patient a quite light or liquid diet the day before operation, no food of any sort the day of the operation unless the patient's vitality is below par, when some form of liquid nourishment is administered to within two or three hours of the anesthetic time. All other factors being equal, the smallest amount of food and feces we have in the gastrointestinal tract at this time the better for the patient. As I usually begin operating about 2.30 P.M., the patient has by that time had ample opportunity to get results from the routine of fasting and the administration of purgatives.

The evening of the day before operation a soap poultice is applied to the operation site and vicinity; this remains for two or three hours, when the part is carefully shaved, then washed with liquid antiseptic soap and warm water, followed by alcohol to remove the residue of soap. During the cleansing process care is taken not to produce abrasions, a soft brush or preferably a gauze pad being used to scrub the skin. In this preliminary skin cleansing a careful aseptic technique should be maintained. A sterile gauze dressing is applied and retained in place by a bandage. As containers for the solutions used in cleansing the skin site, glass flasks of appropriate size having well-fitting rubber stoppers with bent glass tubing are used. This insures a small, steady stream that can be stopped or started at the right time and directed to the desired spot.

A purgative of some sort is given the evening of the preparation and a saline early the next morning. This is followed in two hours by a soap-suds enema if necessary, and later by saline enemas until they return clear. The bichloride compress is not used for the reason that it macerates the epithelium and diminishes the regenerative powers of the skin. The dry dressing is as a rule undisturbed until after the anesthetic has been started, when the final cleansing of the skin is done. Precisely the same technique is observed as in the preliminary cleansing, with the addition of a one-per-cent solution of iodine, which follows the alcohol and is allowed to dry on the skin. The patient is covered by a sterile fenestrated sheet; the operation area is outlined by sterile towels and loosely covered until the operation is begun. It is an easy matter to overdo in our attempts at asepsis. Overzealous scrubbing, too much energy expended in this direction, will defeat the end aimed at. Naturally in emergency cases the preliminary cleansing will have to be omitted. The solution of iodine may be made up with dilute alcohol or in accordance with the appended formula: Iodine, 2.5 Gm.; potassium or sodium iodide, 5.5 Gm.; water, 250 Cc. This gives a 1:100 solution, which can readily be diluted to any desired strength by the addition of water.

Granted that the attainment of absolute asepsis of the skin is about as impossible as squaring the circle, it yet behooves us to try to reduce the bacteria to the smallest possible number to each square inch of surface. In the preparation of the operation site one needs to have an intelligent appreciation of the possibilities of skin infection and the consequences of the same. As the complete sterilization of the skin with our present crudeness and limitations of science is a futile impossibility, we have to make the best use of the opportunities at hand. The value of the iodine solution as a germicidal agent for streptococci and staphylococci has been bacteriologically proven beyond a doubt; clinically this method has been productive of the happiest sort of results, and it is easy to conclude that as a chemical agent for at least the partial sterilization of the skin iodine is the most satisfactory substance we at present possess.

For purposes of mere mechanical cleansing of many of the mucous membranes

of the body prior to operation I have the parts copiously flushed with physiologic saline solution. Urinary antiseptics are used to improve the sanitary condition of the urinary tract. A dilute solution (1 to 1000) of iodine is used to irrigate the vagina and uterus. The cleansing of the vagina is a subject often neglected; a careless sort of douche is given, and the part is said to be clean. Every part of the vaginal wall should be carefully cleansed with liquid antiseptic soap, hot water, and a thorough scrubbing with a gauze pad. Especial attention should be paid to the space just behind the cervix, where discharges are prone to accumulate and entirely escape the average douche. Alcohol causes too much burning for use on the mucous membrane even of the vagina. The soap should be removed by free use of warm water; thereafter the dilute iodine solution should follow.

The teeth and mouth of both operator and nurse as well as patient should be kept in the best possible condition in order to guard against such potent sources of infection. Regular visits to the dentist and the frequent use of a tooth-brush with or without some good mouth-wash are the requisites of common decency.

The presence in the operating room of an individual suffering from ozena, alveolar abscess, or other suppurative conditions, nasal catarrh, coryza, inflammatory conditions of the pharynx or tonsil, bronchitis, or pulmonary tuberculosis is a menace to the patient.

Upon the hand of the surgeon much depends. A large, fat hand is a serious handicap. While the size of the hand cannot well be regulated it can at least be well groomed. Great care of the hands should be taken; they should never become abraded or chapped. Gloves should be regularly worn out-of-doors for their protection. The fingers should never be contaminated with pus or soiled dressings. All hangnails should be removed with cuticle scissors; if the cuticle is well pushed back from the base of the nail every day or two these will seldom form. Keeping the nails short by the frequent use of the file is better than frequent cutting with knife or scissors, which tends to make the nails become brittle and split. The metal nail cleaner should not be used to remove the accumulations of dirt under the nails, but the orangewood stick, which produces no abrasions, should take its place. When the nails are to be cut they should first be softened by soaking in warm water. Cracks, fissures, or roughened places on nails or hands act as nidi for dirt and promote infection.

Just prior to operation the hands are washed thoroughly with green soap and running hot water. All collections of dirt are removed from under the nails. After the washing is resumed the ends of the fingers and the palmar surfaces of the hands are scrubbed with a Tampico nail-brush; the forearms, the backs of the hands, and the spaces between the fingers are systematically scrubbed with a towel during the cleansing process, care being taken to miss no part. The stiff nail-brush ordinarily used is apt to produce slight abrasions on the arms that may be a source of infection. The hands and arms are then washed thoroughly in 70-per-cent alcohol and rinsed in sterile water. Antiseptic solutions are not used for the reason that they irritate the skin and give a false sense of security.

Rubber gloves are worn as a part of the regular routine in all operative work, obstetric cases, vaginal and rectal examinations, etc. I have never been able to subscribe to the German custom of having the hands bare and wearing rubber boots or overshoes in the operating arena. Among the disadvantages of gloves as enumerated by those who oppose them I note expensiveness, short life, masking of tactus, and the slipperiness of gloves. Among the advantages I mention the protection of the surgeon and the patient from infection by the intervention of a germ-proof, easily sterilized cover for the hand. The contact of the glove with the intestinal peritoneum is less irritating than the bare fingers. The cost of gloves is of

course considerable, but is small when compared with the benefits to be derived from their use. By taking good care of gloves and by mending those punctured or torn the cost can be somewhat lessened. The sense of touch is practically unimpaired for those who are accustomed to their use. After wearing them several hundred times one arrives at such a degree of facileness in their use that the fact that gloves are being worn during the operation is scarcely noticed or thought of. It has been proven by scientific tests that the interference of gloves with the delicacy of touch is most infinitesimal. By the interposition of gauze one layer in thickness between the gloved finger and the viscus being held all sense of slipperiness is done away with; or if one wishes, slightly roughened gloves can be worn.

Dry gloves are used in all of our cases; as a rule they are sterilized by steam; if by chance they have to be boiled they are protected from the sides of the vessel by being wrapped in a towel. When taken out they can be dried between sterile towels and dusted with sterile talcum. As a damp or wet glove is troublesome to put on care should be taken to have the gloves well dried out. After the hands have been well scrubbed as previously described, they should be dried with a sterile towel and well dusted with sterile talcum shaken from a sterile container; the gloves are then drawn on. In putting on gloves the chief object to be attained is the getting on of the glove without touching its outside by the skin of the hand or the fingers or any surface that might cause contamination. The right-hand glove is picked up by the thumb and the finger of the left hand at the point of turning of the backward fold (the gauntlet part of the glove has been turned backward prior to sterilization in order to facilitate the technique of putting on the glove) of the gauntlet, and the glove is drawn on, a gentle but steady pull being made to prevent tearing. Then the square of sterile gauze in which the right-hand glove has been wrapped is spread over the palmar surface of the right hand covering the tips of fingers and thumb; with the gauze-enveloped right hand the left-hand glove is picked up by the turned-down cuff and drawn on. Thus the outside of the right-hand glove is protected from contact with the skin of the left hand or wrist. Then the turned-down cuffs are pulled up over the tightly buttoned wristband of the long-sleeved gown. This method properly carried out insures a sterile pair of prehensile organs.

The gowns worn have long sleeves which may be buttoned closely about the wrists. If a glove is torn or becomes contaminated during operation (this should happen seldom) a clean glove should be substituted at once. If a finger is punctured a sterile finger-cot should be slipped on over it. Dry gloves are much easier to put on than wet ones. The sterile talcum next the skin absorbs a certain amount of perspiration. By the use of wet gloves the skin of the hand is not only macerated, but if a finger is punctured a solution of dead epithelium, water-infected perspiration, etc., will at once be poured into the wound.

As previously stated, long-sleeved gowns are worn. If the arms are bare and gloves are worn it is clear that the purpose of the gloves will be defeated, for the arms must necessarily come in contact with the hands and instruments or even the wound itself. Attached to each gown in front at the neckband is a piece of gown material four or five inches wide and long enough to come up over the mouth and nose to the level of the eyes. This mask is secured by tapes passed above the ears and tied at the back of the head. This device not only acts as a guard to stop the outward passage of particles of saliva expelled by breathing and talking, as do the strips of gauze or the face mask ordinarily used, but being a continuation of the gown it prevents epithelial scales and perspiration from falling where they should not. A cap is worn that covers the hair entirely and

can be tied with tape to fit snugly. As a possible precaution against falling particles the cap is put on before the gloves are.

Green soap is used for the hands. This is sterilized by boiling, and is kept in a telescoping container which protects its contents from contamination by exposure to the atmosphere. Sterilized green soap made into a freely flowing fluid by dilution with alcohol and ether is used in the preparation of the skin of the patient.

Nail-brushes are boiled and kept in sterile containers. The usual custom of keeping brushes in bichloride solution is unsatisfactory, as the brushes rapidly become softened and unfit for use. The usual Tampico fiber brush is ordinarily used, as it is cheap and effective.

Putting on first glove.

The number of instruments is limited to the smallest number with which the work can satisfactorily be done. A large number of appliances are a hindrance rather than a help to clear-cut and direct methods. The operator who knows the uses of a few good instruments well and is deft with his fingers can do rapid and easy work. Instrument trays are not used; the instruments are taken directly from the bicarbonate of soda solution in which they are boiled and laid on the instrument table, which has been covered by sterile towels. The instruments, being hot when laid out, are speedily dried by their own heat. An adjustable table which extends over the body of the patient is a great convenience.

Putting on second glove

Wounds are made as short as is consistent with good work. The general direction of muscular fibers is followed, and separation with displacement rather than division practiced wherever possible. In going through the abdominal wall, the scalp, or other soft tissues I frequently use sharp-pointed scissors to the exclusion of a scalpel. Easy and accurate division is insured, the bleeding is not so free as when a sharp knife is used, and the number of instruments is lessened. A small opening is made in the parietal peritoneum, and this is stretched rather than cut to the requisite size. Before making the opening the peritoneum is separated with the finger from the superimposed structures for a short distance on either side;

Arrangement of face mask.

this makes the peritoneal suturing much easier. The various points at which pathological changes are commonly found are inspected systematically as a regular routine. Blood or other fluid is removed by dry sponging, and irrigation is seldom resorted to. Bleeding is controlled by temporary pressure with hemostats, by torsion of the vessel end, or by individual ligation of the arterial branches. Ligatures are seldom applied to structures *en masse*. Catgut is used exclusively as a ligature material. Unnecessary conversation is avoided. As nearly as possible the same system is followed in each operation in order that nurses and assistants may become habituated to a certain routine, and thus be enabled to anticipate the various steps of the operation.

For all internal and buried sutures I use catgut; plain for all peritoneal work; 10-day, chromicized, for closing a perforation or the inversion of an appendix stump; 20- or 30-day for fascia and hernia; and 30-day for bone. The catgut used is put up in sealed glass tubes by a house of undoubted reliability, or is the iodized catgut in ordinary use. I invariably use silk for the skin; this is prepared by boiling in a 1:10,000 solution of bichloride to render it inimical to whatever germs it may have collected in its passage through the skin. For simple interrupted coaptation or tension sutures silkworm-gut is used; this is dyed red for negroes and blue or black for whites; the color contrasts make the stitches easy of removal and at times obviate the possible danger of a lost suture with its small suppurating sinus. For gastroenterostomy, intestinal anastomosis, and similar work the Pagenstecher linen thread is most valuable; it does not act as a wick to carry infection, it is of great tensile strength, and is easily handled. For the coaptation of external wounds silkworm-gut or horsehair is generally used. Whenever possible I dispense with all sutures that puncture the skin and use a subcutaneous suture of plain catgut. The number of cases of wound infection will be lessened by the observance of this technique.

When the condition of the patient permits the necessary time to be taken the incision wound is sutured in layers. The parietal peritoneum is united with 10-day catgut. Next the fascial edges are approximated by a continuous suture of 20-day catgut, an interlocking stitch being taken at every third or fourth stitch to prevent a possible slipping in case either end should become loosened. Sutures are necessary evils, and we must use them carefully in the approximation of tissues, avoiding as far as possible strangulation even of small masses of tissue with the possibilities of slight necrosis and stitch infection which may follow overtight tying of sutures. After peritoneal fascia and skin have been securely approximated atmospheric pressure may be trusted to for the prevention and obliteration of dead tissue spaces.

Drainage is a crude, imperfect, and barbaric procedure and a mechanical insult to the tissues. In a few clearly defined conditions I find it necessary and use it. In clean cases where free extravasation of blood or serum is expected, as after the closure of some scalp flaps, operations on the kidney, some amputations, removal of the breast, and retrenchment of the scrotum, a few strands of silkworm-gut left in twenty-four hours are effective and do but little harm. In infected cases I drain abscess cavities or localities where a portion of an abscess wall may of necessity be left behind, and where there is danger of leakage from the urinary or gall-bladder. In this class of cases I use two varieties of drainage material—rubber tube or the gauze drain partially enveloped with rubber dam in cigarette fashion. In general peritonitis the methods of drainage often resorted to are worse than valueless. Any form of drain will be walled off and inert in six hours, availing nothing but the production of a multiplicity of adhesions. If there is any localized collection of semipurulent fluid, a simple incision allowing its escape without the intervention of gauze, glass, or rubber tube drainage will

be effective. It has been said "when in doubt drain;" when in doubt I do not drain, and feel that I have not gone far wrong in such matters. I have sutured gunshot wounds of the stomach and bowels as late as thirty-six hours after receipt of injury, and had perfect recoveries without the use of either irrigation or drainage.

Irrigation of the peritoneal cavity is one of the greatest misconceptions ever fathered on a profession. If I wished to shock a patient profoundly I would open the abdomen of a case of peritonitis, irrigate thoroughly with salt solution, and practice drainage through multiple incisions. I remove blood, serum, escaped fecal matter, etc., by dry sponging, then close the abdomen. The peritoneum can safely dispose of a considerable amount of toxic material if not hurried and left to handle it in its own way. Irrigation even with salt solution irritates the peritoneal tissue, scatters widely all toxic material, promotes absorption, and puts the patient in immediate danger of being overwhelmed by an excessive amount of poison.

A dressing of absorbent gauze and cotton is placed over all wounds and held in place by adhesive strips. We formerly used a collodion dressing, but this may retain perspiration—especially in warm weather—and may in that way bring about wound infection. If the gauze remains dry and there is no reason for believing that the wound is not in good condition, the dressings are not disturbed until the tenth or fifteenth day. In drained cases the dressings are changed as often as saturated. In the dressing of wounds strong solutions of antiseptics are not used. The dressings if caked are softened with warm saline solution. Peroxide of hydrogen acts as an irritant to the tissues and is seldom used. Wound secretions are removed by irrigation with saline solution. If suppuration is free or persistent a weak solution of iodine, 1:1000, is used for irrigation. Raw surfaces are protected with strips of rubber dam sterilized by boiling. The granulations grow through the meshes of gauze and are torn off when it is removed. Wounds are not fingered when dressed, such proceeding being neither good for the fingers nor the wound; knife-and-fork dressings are done as far as possible.

After laparotomies a laxative of some sort is usually given about the third day. After operations on the rectum or perineum the patient is fed small amounts of albumin, which leaves but little residue, and the bowels are kept locked from ten to sixteen days with perfect impunity. The bowels in such cases are moved with the patient lying on the side to prevent the damaging effects of undue straining.

My conclusions in regard to the subject of operation technique are:

That bichloride of mercury as ordinarily employed is useless and engenders a false sense of security.

That the bugaboos of prolonged scrubbing of hands and arms with rough brushes and the reckless use of strong bichloride solutions favor rather than diminish the chances of infection in the long run.

That the iodine solution is comparatively non-toxic and highly antiseptic. Laboratory experiments have conclusively proved that as a germicide a 1:500 solution of iodine will do in five minutes what it takes a 1:1000 solution of bichloride half an hour to accomplish.

That persistent care of the hands and the wearing of gloves is of prime importance: to protect the patient from the operator and to protect the operator from the patient. The objections are slight as compared to many advantages accruing from their use. Face masks are advantageous in the prevention of wound infection. Long-sleeved gowns are indicated for the sake of consistency in technique.

That irrigation and attempted drainage of the abdominal cavity are as a rule inadequate and harmful.

That whenever possible unabsorbable buried suture material should be avoided.

That the evils of drainage are many

and the indications for its use are few. When in doubt do not drain.

That Kelley's method of starvation diet to prevent the formation of scybalous masses that might tear newly united perineal tissues, and of locking the bowels for from ten days to two weeks to allow ample time for healing after plastic operations on rectum and perineum, has many advantages.

GASTRIC CARCINOMA—BACTERIOLOGIC DIAGNOSIS.

It is claimed by PALIER (*La Presse Médicale,* No. 99, 1906) that the combination of certain bacteria in the gastric contents removed by lavage permits an absolutely certain diagnosis of cancer. Negative results render the diagnosis of cancer unlikely, while partial results are of less value.

To make the diagnosis certain, three characteristics must exist coincidentally, namely: (1) The absence of yeasts and molds. (2) The presence of cocci, either staphylococci, streptococci, or diplococci, even in small number. (3) The presence of long, wavy chains composed of bacilli united by their ends at a slight angle. These have been known as the Boas-Oppler bacilli, but the name bacillus geniculatus would be more appropriate on account of the angular joints where they unite. The presence or absence of other bacilli has no influence on the diagnosis.

After a test meal the stomach is washed out and two tubes are inoculated, one of glucose-gelatin for the molds and yeasts, and one of plain gelatin for the bacteria. These are kept in the incubator forty-eight hours and then examined. The growth in the glucose tube can be determined with the naked eye, but it is necessary to make smears from the sediment in the other tubes, and to stain them by Gram's method and eosin. The bacillus geniculatus is stained by Gram, and if it is found together with stained cocci and there is no growth in the glucose tube, the diagnosis of cancer is certainly correct.

THE TREATMENT OF GONORRHEAL ARTHRITIS.

In the *Journal of the American Medical Association* of February 2, 1907, WITHERSPOON says that treatment is as varied as it is unsatisfactory. In the acute types rest in bed should be ordered, and fixation of joint by splints to relieve pain, which may be so severe as to demand an opiate. In England they insist on large doses of quinine. Local applications, hot or cold, are often grateful, one of the best local applications being a 50-per-cent ichthyol ointment early in the case. Internal administration of drugs rarely influences the trouble, and is not advisable, except to meet symptomatic conditions. The salicylates are harmful, and add to the patient's discomfort by disturbing the stomach, and yet they are almost universally given. In chronic cases general reconstructives are useful, and potassium iodide. In both the cure of the initial lesion is to be recommended as rapidly as possible.

The author does not agree with the writers who condemn all surgical interference. Great benefit is often derived, according to the case. In some, strapping the joint with adhesive plaster, being careful not to surround the whole joint, will give relief; in others, aspiration must be advised; and in suppurative cases incision and drainage is the only treatment.

Some very remarkable cures have been reported by Fuller, who insists that the infection comes from a gonorrheal vesiculitis, and by opening and draining immediate amelioration of the arthritis takes place. With regard to this the author can speak only of one case. The case was of two years' duration, and great emaciation and general bad health existed. Both knees were swollen and painful. Much relief followed the operation, and rapid improvement of the arthritis was noted in a few days. In view of the pathology in the joint and the presence of the infective agent found in the effusion, it is difficult to explain the rationality of this treatment.

EDITORIAL.

THE TREATMENT OF VARIOUS FORMS OF HEADACHE.

The recognition of the fact that headache is purely a symptom and never a disease is essential for the successful care of patients who suffer from this frequent malady, and the administration of the very large number of pain-relieving drugs which are now before the profession is of little value in the majority of cases if the underlying cause of the attack of pain is not removed as soon as possible by other measures of a more permanent nature, and of a character which will get at the deeply seated factors in the case.

There are two forms of headache to which the term "rheumatic" is sometimes applied, although the term "gouty headache" is also used to describe them. In one of these the pain is distinctly neuralgic in character, and frequently limited to the distribution of a single nerve, as the supra-orbital branch of the fifth. The other type of headache of this character, sometimes called myalgia capitis, involves the muscles of the scalp, the temporal and frontal muscles, and even extends to the trapezius muscle as well. This headache may be unilateral or bilateral. Although both may be relieved during the acute attack by the ordinary coal-tar products, they are best cured by outdoor exercise and the use of the salicylates, the iodides, and Turkish baths. In some instances hot compresses give relief in the acute attack.

Syphilitic headache, which is so often of a dull character, or, in other instances, exceedingly severe, the so-called "crashing head pains" of syphilis, cannot be relieved, as a rule, by any of the ordinary pain-relieving drugs, and full doses of morphine may be necessary. It goes without saying that active antisyphilitic treatment with the iodides or mercury is needed in such a case. It must be remembered, however, that these syphilitic headaches may be due to the disease involving a number of tissues. In some instances it is a syphilitic periostitis, in others syphilitic meningitis or cerebritis, and in still others it is due to the growth of the gumma which produces pain by pressure, in which case pressure symptoms, and all those of brain tumor, will probably be present.

In that type of headache which depends for its existence chiefly upon nervous exhaustion, rest in bed with massage, the administration of tonics, and the support of a tired heart by small doses of digitalis are usually advantageous. In many of these patients as soon as they become strong enough to react, hydrotherapeutic measures are exceedingly advantageous. In the early stages if there is cerebral congestion, a general hot pack, and an ice-bag applied to the head, may be useful. Afterward a cold drip-sheet may be thrown around the patient for a moment.

Headaches of the migraine type depend, in the majority of instances, upon some form of autointoxication. In some instances this autointoxication is gouty or lithemic in its nature, when of course the salicylates are advantageous; or in others it depends upon the absorption of toxic materials from the intestine and upon hepatic inactivity, not only in the secretion of bile but in the carrying out of that most important function of the liver, the destruction of poisons which may be absorbed from the alimentary canal. Such cases usually require some intestinal antiseptic, such as the sulphocarbolate of sodium, or guaiacol, the hurrying of digestion by the use of pancreatin and taka-diastase, and the use of small doses of calomel or podophyllin to stimulate hepatic and duodenal secretion. In many cases the attack is best arrested by the adminis-

tration of a brisk saline purge followed by the use of one of the coal-tar products associated with the bromides and caffeine, or, if the circulation is excited, or the arterial tension high, by substituting gelsemium for the caffeine. Occasionally, neuralgic or migraine headaches are dependent upon carious teeth or nasal disease, and in this connection violent pain in the face and forehead, coming on in the course of influenza and acute colds, should always be considered as being possibly due to infection of an antrum, relief only being obtained when the involved antrum is properly drained.

Uremic headache often gives warning for several days before severe uremia develops. Too often, however, its warning note is not recognized until more grave symptoms develop. The patient should be at once put to bed, warmly covered, his skin kept active, and if his heart is strong enough a hot pack should be administered, with cold applied to the head, and the use of large doses of caffeine if the kidneys are not irritated and the circulation is not bounding.

There still remain to be considered the headaches which are due to eye-strain, which are to be relieved by the fitting of proper glasses, the headaches which arise from arteriosclerosis, and those which also develop as the result of perverted metabolism associated with marked phosphaturia. In connection with the subject of proper glasses it is surprising to find how frequently headaches continue not because the oculist has not ordered the proper glasses, but because the patient wears the glasses improperly, or in the course of time so bends the frame that the erroneous adjustment of the glass renders the condition worse than before.

In the arteriosclerotic cases the use of the iodides and nitroglycerin to diminish tension is essential. In those forms which are due to vasomotor disorders, hydrotherapeutic measures are best, whereas those headaches which arise from gastrointestinal catarrh are to be treated by the use of alkalies, bitter tonics, and digestives.

THE TREATMENT OF MALARIA.

With the discoveries which have been made during the last few years in regard to the manner in which malarial infection is spread, the importance of treating the individual paroxysm of malarial fever by the administration of quinine has been equaled and surpassed by the measures which are essential for the protection of the well, so that they will not fall victims to the disease. It is no longer sufficient to administer calomel and quinine to such patients with the idea of destroying the parasite in the blood. The quinine must be given not only to protect that individual from the influence of the parasite but to protect other individuals, since as long as the parasite remains in his blood it is possible for the mosquito to transfer the infection to another person, and as Krauss points out in an excellent article in the *Journal of the American Medical Association* of March 16, 1907, it is quite as essential for the stamping out of the malarial epidemic that the patient shall be put to bed and protected by mosquito-netting as that this plan of treatment shall be instituted for the prevention of the spread of yellow fever. If patients suffering from this disease are isolated in this manner, if persons exposed to mosquitoes are careful to protect themselves by netting, if pools and other places in which the Anopheles can breed are eradicated, it becomes entirely possible not only to cure but to prevent malarial infection. This being the case, it is important that every physician should bear in mind that the disease is absolutely preventable, and indeed is much more readily prevented than diseases which are propagated by bacteria like those of typhoid fever and pneumonia. It has been said that every death from typhoid fever is a manslaughter, since had the discharges from another patient been properly disinfected infection would not have taken place. In many parts of the country the mortality from malarial infection is quite

equal to that produced by typhoid, and therefore prophylactic measures are to be carried out vigorously, and if carried out give promise of equal possibilities of preserving health and life.

THE SALT-FREE DIET FOR DROPSY.

On a previous occasion we have called attention in the editorial columns of the THERAPEUTIC GAZETTE to what is sometimes designated the dechlorization treatment of dropsy, which consists in excluding from the diet to the greatest possible extent ordinary table salt. It will be remembered that the theory upon which this treatment is based depends upon the fact that the kidneys in certain cases of Bright's disease are unable to eliminate the normal quantity of salt, with the result that an excess of salt accumulates in the tissues, and in order that the juices of the tissues may have the proper molecular concentration very considerable quantities of fluid are extravasated. If in such a condition the patient receives a diet which carries into his system very little salt, the kidneys constantly eliminating salts in small quantities, a condition arises in which the molecular concentration falls, there is no longer any need of fluid in the tissues, this fluid is rapidly absorbed, carried to the kidneys by the blood-vessels, and so eliminated, particularly if at the same time moderate saline purgation is used and diuretics like caffeine, theobromine, or digitalis are employed. It is noteworthy that this plan of treatment is of practically no value in cardiac dropsy, in which condition the tissues are not laden with an excess of salt, but are dropsical because of circulatory failure. On the other hand, in a large proportion of cases met with in actual practice, both cardiac and renal lesions are associated, and therefore the salt-free diet may prove advantageous. We have employed this method in a few cases with apparent advantage, although we have not been impressed with the idea that it possesses extraordinary abilities to relieve anasarca.

In the *Medical Record* of March 9, 1907, Dr. Peabody contributes an article upon this subject in which he gives the result of his own experience with the employment of this plan of treatment, an experience which leads him to speak of it in terms of commendation. As he well points out, it is almost impossible to administer a diet which is absolutely salt-free. The first thing, of course, is to prohibit the patient from using salt with his food, and secondly, to see that in the cooking of his food salt is not added during that process by the cook. The diet can be almost as liberal as that which is allowed the ordinary healthy individual if this precaution is taken, and the following list, suggested by Peabody, may be employed with advantage:

Breakfast: Coffee or tea, eggs, cereals, cream, fresh butter, fruits, bread made without salt.

10 A.M.: A glass of milk.

Dinner: Chicken, fish, potato variously prepared, bread made without salt, ice cream, jelly, fresh butter, cocoa ℥viij.

3 P.M.: A glass of milk or water.

Supper: Eggs, chicken, bread without salt, jelly, custard, cream, fresh butter, tea ℥viij.

8 P.M.: A glass of milk or water.

After the anasarca has diminished to such an extent that it is no longer manifest, it is not proper to maintain the absolutely salt-free diet. Small quantities of salt may be allowed until evidences of edema are once more developed, when the salt should be once more stricken from the diet list. It is well to remember that one of the best ways of determining that a patient is rapidly using an excess of fluid is not alone to measure the quantity of urine passed, which often depends to a large extent upon the amount ingested, but to weigh him, any marked loss in weight being an excellent criterion of the quantity of fluid which is being lost from the tissues.

THE DIAGNOSIS OF TUMORS—THE RESULTS OF OVERCONFIDENCE AND DELAY.

Anything which Richardson writes is well worth the careful attention of the entire profession. Perhaps he can teach no lesson of greater importance, in so far as the lessening of human suffering and preservation of life are concerned, than that found in his contribution to the *Boston Medical and Surgical Journal* (vol. lvi, No. 110). He notes that even with our improved facilities the diagnosis of tumor is at the present day uncertain in the hands of the most experienced—from which it results that many unnecessary, not to say unjustifiable, operations are performed, while many imperative ones are withheld. Richardson states that he has been long deeply impressed, and during the last few years even more so than before, by the evils which follow the overconfident diagnosis, whether of malignancy or benignancy. Clinical histories are crowded with tumors in their early and operable stages and their worse than useless treatment by "absorbents," "counter-irritants," trypsin, and other newly-discovered and much-advertised "scientific" methods of sure cure. In some instances, but too few to be in the aggregate of serious moment, his operative records contain the pathologist's report of benignancy when the operative diagnosis read malignancy.

In the diagnosis and treatment of tumors the most desirable because the most beneficial propositions may be expressed as follows:

All tumors should be regarded as malignant until they are proved benign.

No tumors can be proved benign while they are still in the body.

Therefore all tumors should, if possible, be removed.

The demonstration of this proposition, based on huge clinical experience, is almost complete.

The breast tumor cannot at any age, and especially after the age of thirty, be diagnosticated as benign with an accuracy sufficient to permit indefinite delay. Although in young girls malignant disease of the breast is unusual, Richardson has seen the most malignant form at nineteen. Because of the rarity of cancer in the young its presence is apt to be overlooked. This is especially distressing since the disease runs in young women a singularly virulent course. It is noted that some regions are so commonly the seat of malignant growths that the region itself may add the decisive evidence in favor of extirpation. The tongue, pylorus, and esophagus are included in this group. In fact the whole alimentary tract is the seat of malignant so much more frequently than of benign growths that the general rule of universal extirpation, when possible, is applicable. It is conceded that the individual operator would find it difficult to collect from his records a half-dozen benign neoplasms from the whole alimentary tract; hence the surgeon must be especially careful and sure of his diagnosis before he advises non-intervention in tumors which, from their situation alone, are likely to be malignant.

Richardson believes that cancer of the lip is by nature no more curable than cancer of the pylorus, the cervix uteri, or the anus. It is taken early because its presence cannot be ignored, and hence the prognosis is extremely good.

As to pelvic tumors Richardson holds that the correct diagnosis of the great majority is comparatively easy, whilst the correct diagnosis of some is beyond human power. The mistakes made in a hundred consecutive cases will be very small. To narrow still the margin of error we must admit our fallibility and uncertainty. Were it not that the commonest source of error is the malignant ovarian tumor, the importance of exploring every doubtful case would not be so great. Were it not that many a uterine hemorrhage is dependent upon concealed cancer of the uterine body, it would not be so important to operate upon what seems to be a simple submucous fibroid or a uterine polyp. Were it not for the frequent occurrence of cancer of the

cervix, it would not be necessary to regard every doubtful cervix as the probable beginning of malignant disease.

Richardson closes his paper with the following conclusions: The failure of the patient to consult the physician early; the delay of the physician to recommend the surgeon; the surgeon's late recognition of malignancy; the surgeon's half-hearted operation—these sources of failure will be, to some extent at least, done away with. Instead there will be early resort to the knife, with a faith on the part of the operator that the broadest practicable dissection of a neoplasm means total extirpation of the disease and permanent cure.

Hopeful as we all are of any easy and effectual destruction of malignant disease without resort to surgery, Richardson does not believe that so great a boon to humanity is in store for us. He has seen too many dismal failures follow loudly heralded methods of cure, whether of tubercular or of malignant disease. Not that there may not be made at any time some discovery the wonders of which will surpass the imagination—like the *x*-ray, for example—but in our hopelessness of such a splendid achievement we must not lose faith in our present methods, which, uncertain and discouraging as they are, have possibilities of brilliant success.

ENUCLEATION OF THE PROSTATE.

Freyer (*British Medical Journal,* March 9, 1907), who may be regarded as the high priest of suprapubic prostatectomy, if he is not the originator of this operation, has been so conspicuously before the profession as the champion of the transvesical route, and has published results so excellent, that a further contribution based on a series of 119 cases is worthy of more than passing notice. From September 6, 1905, to July, 1906, he has operated on this number, of which 30 were in hospital and 89 in private practice. The age of the patients varied from fifty to eighty-six years, the average being 68¼ years. The prostate weighed from half an ounce to 9¼ ounces, the average being a little over 2½ ounces.

In connection with these 119 operations there were 9 deaths, the remaining 110 cases having been completely successful. One died from jaundice on the fifteenth day, there having been a complication of malignant disease of the liver; one died from pulmonary embolism on the fifth day; one from shock seven hours after operation; and six from uremic symptoms from three to thirty-nine days after operation. There was one consecutive series of thirty-nine operations without a death.

Freyer seems to have refused operation in no instance, although preliminary drainage of the bladder was practiced where it seemed needful. By careful elimination of the cases which did not die as a direct consequence of the operation his mortality record will be reduced almost to the vanishing point. The rate as it stands is distinctly higher than that of perineal prostatectomy.

FOREIGN BODIES IN THE BRONCHUS.

In a recent number of the THERAPEUTIC GAZETTE there was reported the removal of a foreign body from the bronchus by means of a bronchoscope, together with reference to other successful cases. When the difficulty and danger incident to a surgical operation for direct access to this portion of the air-passages is remembered it will be conceded that an instrument so devised that access may be gained and clear vision procured without operative procedure will fill a most useful purpose.

Large (*Cleveland Medical Journal,* March, 1907) reports the case of a man twenty-eight years old who inspired a peanut into his right bronchus. Nineteen days later the trachea was anesthetized with a 20-per-cent cocaine solution. The patient was placed on a low stool with the head thrown well backward, and a tube was inserted into the larynx. This tube, which was 13½ inches long, enabled the

operator to see the foreign body lodged in the bronchus and enveloped in thick mucus. On grasping with forceps it broke off and was removed in four pieces. The patient went home the next day and developed pneumonia, from which he recovered. During the operation no blood was seen and the patient had no pain.

The instruments employed are so simple, the technique so readily acquired, that there seems no reason why this method of procedure should not be generally known and practiced.

DIRECT TRANSFUSION OF BLOOD.

There are few researches in the realm of experimental physiology which give greater promise of usefulness both to the surgeon and the physician than those of Crile and his associates Lower, Dolley, Hitchings, Lenhart, and Eisenbrey. Crile and Dolley seem to have established the fact that normal blood of animals of the same species is physiologically interchangeable. The technique of this interchange—*i.e.*, by suturing the artery of the donor into the vein of the donee—is so well established that it has become comparatively easy of execution, and Crile now reports a number of cases in which the method was given clinical trial.

In the first case reported of advanced pernicious anemia, with a red count of 875,000 and hemoglobin 15 per cent, transfusion was followed by a temporary improvement in both the physical well-being and the blood picture. Acute dilatation of the heart followed, and within five days the new blood had disappeared and the disease progressed steadily until death.

The next reported case was one of splenomyelogenous leukemia which had resisted a carefully executed medical course and the *x*-ray. This case was first bled and then transfused. There was temporary marked gain in vitality manifested by an increased well-being, appetite, and strength. The blood picture of leukemia, however, showed no change, though the spleen became gradually smaller. There was no evidence that the natural history of the disease was modified.

The third case, one of carcinoma, was transfused for the purpose of controlling cholemic hemorrhage, the gall-bladder having been invaded by cancer. The transfusion produced no improvement in the malignant disease.

In four cases of chronic suppuration transfusion was practiced for the double purpose of lessening the anemia and supplying better fighting leucocytes in extremely reduced and anemic cases of prolonged intractable suppurations. Although there was distinct improvement in vitality and general well-being the improved blood picture did not continue as in transfusion in certain other diseases, nor was there a noticeable improvement in the local suppurative field.

One case of tuberculous pleuritis and peritonitis, in which laparotomy and drainage of the chest had been performed, exhibited after transfusion a marked improvement of the general state, in appetite and in strength. The improved blood picture was maintained. The latest observation showed that the disease was not progressing and that general health and strength were improving.

It is noteworthy that transfusion exercised a potent influence in controlling hemorrhage. Thus the case of carcinoma of the gall-bladder to which allusion has already been made, and which exhibited hemorrhage from the bowels, uterus, and nose, as well as subcutaneous bleeding in many parts of the body, was subjected on the day following transfusion to exploratory operation, nor was this followed by any unusual hemorrhage. Moreover, four cases of chronic hemorrhage from the bowels, the first exhibiting hemoglobin 15 per cent and a red count of 1,200,000, were cured immediately by transfusion. With a view of transferring immune or protective bodies Crile flooded the vessels of a patient pulseless from typhoidal bleeding with the blood of a young muscular 225-

pound subject who had had typhoid fever. The donee was brought from a condition of clammy unconsciousness into a state of glowing jocoseness, but the hemorrhage recurred in two days and the patient died. In another such instance Crile would advise immediate laparotomy and an attempt to secure the bleeding ulcers by a cobbler stitch.

The clinical trial of the effect of transfusion in shock was applied in the form of prevention in the case of an elderly patient who for five years had been losing blood on account of so-called essential hemorrhage of the kidney, and had become so anemic and reduced as to render him unsafe even for anesthesia. Transfusion was practiced prior to operation. This so raised the vitality that the patient was a good surgical risk and readily endured nephrectomy. As an instance of the value of the transfusion in the treatment of shock a case is reported of prolonged infection and suppuration of the retroperitoneal pelvic space with multiple abscesses, laying bare the sacrum and dissecting up the rectum and sigmoid. The patient was so anemic and reduced that it was not considered safe to give ether. Under nitrous oxide and oxygen a vaginal incision was made and the separate foci converted into a single cavity for drainage. The manipulation was followed by grave shock. The pulse became imperceptible, and the heart was beating at the rate of 186 per minute. During the five hours following she was under vigorous treatment; 1000 Cc. of saline solution was given, and the usual measures were pushed to the extreme. The patient gradually sank. Transfusion was then practiced. At the beginning of the transfusion the pulse could only occasionally be palpated at the wrist, the respirations were 12 and very shallow, the second heart sound was lost, and the eyes were set. Under the influence of transfusion the patient gradually came out of this precarious state and regained consciousness, and was distinctly stronger than at the time of entrance into the hospital. Following this there was no circulatory relapse. This patient finally died of exhaustion eighteen days later.

In summarizing his results Crile groups them into three classes—positive, negative, and undetermined. Among the positive results is transfusion in acute hemorrhage; these are apparently final. In pathologic hemorrhage it has proven positive in improving the patient's immediate condition, and in most instances wholly controlled the hemorrhage itself. In shock its value seems far greater than that of any other remedy hitherto employed. From the experimental standpoint it seems to be the most effective treatment of illuminating gas poisoning.

Among the negative results are transfusion in pernicious anemia, leukemia, carcinoma, strychnine poisoning, and diphtheria toxemia.

Among the undetermined results may be mentioned chronic suppuration, its attendant debility from anemia, tuberculosis, and the acute, self-limited infectious diseases.

Of the 17 cases all were technically successful. In every instance the donee experienced a heightened vitality, and in the absence of serious organic disease the patient became buoyant, even jocose. Some had chills during transfusion or soon after, and a majority showed some febrile reaction later.

This is the first extensive clinical trial that the method of direct transfusion has received. There is no reason to suppose that it will prove a panacea for all ills. Even if its completely successful application is limited to acute hemorrhage it will prove a life-saving means of inestimable value to the surgeon. Crile states quite positively that in the treatment of shock it is the most efficient means he has yet tried, and certainly none other can speak on this topic with so great authority. Incidentally it is creditable to the altruistic spirit of Cleveland that there seems to be no difficulty in finding people perfectly willing to give of their blood to those whose need of it is greater than their own.

REPORTS ON THERAPEUTIC PROGRESS.

THE PRINCIPLE OF TOP MILKS.

In the *New York Medical Journal* of December 8, 1906, CHAPIN writes on this topic, and states that for top-milk modification, bottled milk is almost a necessity. As is well known, if milk is placed in the usual quart milk-bottles shortly after milking and kept cool, the cream will rise rapidly, and within four or five hours will all have risen, leaving only a fraction of one per cent of fat in the milk under the cream. When such instructions as to the care of the milk are given to the milk producer, the growth of bacteria in the milk will be retarded, and when the milk is delivered to the consumer not only will the cream be risen, but the milk will be in much better condition from a sanitary standpoint than if shipped in cans, which are not so easily and quickly cooled. The milk in bottles will not be opened in transit, and the danger of infection by the hands of drivers, by dust, or flies is greatly lessened. The top-milk method thus insures a fresher and safer food than when bulk milk is bought and allowed to stand for the cream to rise, which takes much longer than when fresh milk is used.

The strong point of the method from the physician's own personal standpoint is the ease with which percentages can be varied, and the mixtures made up by the nurse or mother. There are some who have not looked deeply into the subject who think that the method is inaccurate, but as a matter of fact no method approaches it in accuracy, unless standardized milk and cream are used.

The principles on which the percentage modification by the top-milk method are based are very simple, and are as follows: The fat of the milk being lighter than the serum rises to the top as cream. The proteids and sugar remain distributed throughout the milk, but are slightly less in the very rich cream of the upper layers. There are about five to seven ounces of cream on a quart of milk. If this cream is all removed along with enough of the remaining milk to make sixteen ounces, there will be two pints of milk, one containing all of the fat of a quart of milk, and the other pint being practically fat-free. It is self-evident that the percentage of fat in the pint containing all of the fat of a quart or two pints of milk will be twice that of the original quart. If this was four per cent, there would be eight per cent in the top pint. If all of the fat was in one-third of a quart of milk the percentage would be three times four per cent, or twelve per cent.

In practice all of the fat does not rise in the cream, so this mathematical ratio does not hold good, exactly. Thus, the top fifteen ounces is about twice as rich in fat as the original milk, and the top nine ounces three times as rich, instead of the top half, or sixteen ounces, or the top one-third, or ten and two-thirds ounces. This rule holds good with any milk, and has been confirmed by a great many assays. The error should not be made of thinking that the top fifteen ounces or top nine ounces will contain any definite percentage of fat regardless of the richness of the original milk, for that would be an impossibility. A quart of three-per-cent milk could furnish only sixteen ounces twice as rich, or containing six per cent fat, and a quart of five-per-cent milk sixteen ounces containing ten per cent fat. The top ten and two-thirds ounces, or one-third from the quart of three-per-cent milk, could not be richer than three times three per cent, or nine per cent, and the top ten and two-thirds ounces from the quart of five-per-cent milk could not contain over three times five, or fifteen, per cent fat. Now, milk does not run absolutely constant in fat percentage, so a margin of error must always be allowed for. But by working on a basis of four-per-cent milk the error will always be only a little above or a little

below the calculated percentage. If standardized milk was used there would be no error at all. For several years the author has been having the milk at the babies' wards of the Postgraduate Hospital assayed to determine how uniformly this rule held good, and below are the average assays:

	Whole milk. Per cent.	Top 20 ozs. Per cent.	Top 16 ozs. Per cent.	Top 9 ozs. Per cent.
1903...	4.4	6.5	8.4	13.9
1904...	4.5	..	8	12.4
1905...	4.8	6.5	8.5	13.1

These figures represent the average results obtained from 676 separate assays made during the three years mentioned. It will be seen that the percentage of fat in the top twenty ounces is almost exactly one and one-half times that of the whole milk; in the top sixteen ounces a little less than twice; and in the top nine ounces almost exactly three times that of the original milk. If four-per-cent milk had been used there would have been contained theoretically:

Whole milk. Per cent.	Top 20 ozs. Per cent.	Top 16 ozs. Per cent.	Top 9 ozs. Per cent.
4	6	8	12

When these milks are diluted to reduce the quantity of proteids the error of fat would seldom be greater than one-quarter of one per cent, which is negligible.

No such certainty can be depended upon when part of the cream is removed and mixed with milk, or when cream obtained separately from the milk is employed. Allowing that no error is made in calculating the proper quantities to use, the wide variations in the composition of creams introduce a source of error that may make the result fifty to one hundred per cent greater than was desired, and so tangle up the situation as to cast discredit upon the whole system of percentage feeding.

To recapitulate, the principles involved in the use of the top milks are: First, the use of milk bottled at the dairy as soon as possible after milking. Second, the rapid cooling of the bottled milk, which promotes separation of the cream and retards bacterial growth. Third, the taking of definite quantities from the upper portion of the quart of milk which shall include all of the cream and a portion of the under milk. If this is not done no constancy in composition can be expected. After these steps have been followed, preparation of the food consists in simply diluting and adding sugar. In addition to the accuracy of this method, the natural emulsion of the milk is not destroyed, and there is no combining of creams and milks of possibly different ages. Any desired layer of cream and milk can be easily removed by the author's cream dipper, holding just one ounce. The percentage of proteid in the whole milks or top milks will not vary much from three and one-half per cent in any milk generally obtainable. For purposes of ready calculation it is enough to consider the proteids as very nearly running equal to the butter-fat in the whole milk up to four per cent. In the top nine ounces the ratio of fats to proteids will be three to one; in the top sixteen ounces, two to one; in the top twenty ounces, one and one-half to one.

CHRONIC CONSTIPATION.

In the *St. Paul Medical Journal* for December, 1906, ALLEN deals with this question of importance to many practitioners. He says in spasmodic constipation, that form brought about by a contracted state of the small and large intestine, due to irritation of the inhibitory fibers of the splanchnic, as in hysteria and uterine disease, antispasmodics and sedatives, rather than laxatives, are indicated; for this purpose belladonna, opium, and hyoscyamus are useful remedies. Calomel and castor oil on the one hand, and the so-called drastic purgatives, such as senna, colocynth, jalap, rhamnus, and croton oil, on the other hand, should be used only (in habitual constipation) when obstinate retention of the stools must be overcome at once. In other words, they are to be given only occasionally. The same applies to the saline cathartics in maximum doses. The

salines, it is true, are frequently given in a special form under the name of bitter waters that are taken in certain spas, such as Marienbad, Carlsbad, West Baden, Kissingen, and many others; their action depends largely upon the magnesium sulphate which they contain in a large percentage. While they produce an evacuation of the bowels they act like any ordinary laxative, in that the effect is temporary and not permanent. It is possible that in a few isolated cases, in which catarrh of the intestine is the primary cause of constipation, a course of these saline waters may lead to permanent improvement by curing the catarrh. A course at any of the above named watering-places may do this. While these waters do not cure a majority of cases there is no doubt that patients suffering from habitual constipation feel comparatively well while stopping at one of these watering-places; yet it is almost certain that the old condition will return as soon as they stop taking the waters.

Rectal injections or enemas are an important method of the symptomatic treatment of constipation. The exact quantity of fluid to be injected and its composition must be determined in each individual case—that is, we must see whether cold, cool, or lukewarm water, or a mixture of water and soap-suds, vinegar, common salt, or oil, is most effective. Occasionally, especially in the spastic form, injections of olive oil alone produce excellent results, given in quantities varying from two to eight ounces. Lately glycerin has become very popular, administered as an injection in quantities of from 2 to 4 grammes with a small syringe, or inserted into the rectum in the form of suppositories. Glycerin stimulates peristalsis by withdrawing water from the intestinal wall. The tingling sensation that it produces in the rectum after administration can be overcome by the addition of an equal amount of water before being injected. The different kinds of injections all have the advantage of acting purely locally on the large intestine and of stimulating the peristalsis of that portion of the bowel without affecting the stomach, hence they are valuable in the treatment of that form of constipation characterized by fecal retention about the sigmoid and rectum. The same objection, however, is found in this method of treatment as in the case of laxatives: it sooner or later loses its power. It is advisable, therefore, in cases in which the evacuation of the bowels must be artificially stimulated for a prolonged period of time and cannot be avoided, to alternate between the different remedies and methods at our disposal.

In conclusion, laxatives should be avoided as much as possible, and when used preference should be given to aloes, cascara, and podophyllin. Drastic purgatives are to be used only occasionally, when constipation is obstinate and an immediate evacuation is necessary. The bitter waters afford only temporary relief. Sedative and antispasmodic remedies are sometimes required when constipation is of the spastic type. Injections are of certain value, but the disadvantage is that ultimately small quantities of water do not suffice, and the larger amounts must be used, which overdistend the large bowel and thereby render the use of injections valueless. Small injections of glycerin and large injections of olive oil may very properly be recommended. This would leave a great deal to be said in favor of the physical, mechanical, and dietetic treatment of chronic constipation.

In the same issue of the same journal GHENT in dealing with the dietary treatment of constipation presents the following conclusions:

A patient with habitual constipation can as a rule eat any kind of food, but those things should be selected that will leave the largest residue.

1. Vegetables, such as potatoes, especially sweet potatoes, cabbage, lettuce, onions cooked or raw, celery, beans, corn in any form, popcorn between meals, carrots, turnips, peas, radishes, beets, spinach, salads, and melons.

2. Fruits of all kinds: Berries, such as strawberries, raspberries, gooseberries, blackberries; currants, peaches, apricots, plums; apples in any form, cooked or raw,

oranges; bananas, if well borne; pears, grapes, cherries, pawpaws, and persimmons. Most of these fruits may be taken between meals, and especially before going to bed.

3. Meats: Chicken heads the list, fish, roast beef, etc. Nothing is to be taken fried. Honey, syrups, plenty of good fresh butter, eggs, milk, sugar, Graham bread and corn bread. Nuts of all kinds, if well borne by the stomach, along with plenty of highly seasoned foods.

All the breakfast foods are to be used, except oatmeal. It is very constipating.

For drinks: Coffee, not too strong, with cream and sugar; white wines, champagne, ciders, beer, lemonade, sweet milk, buttermilk, especially for babies, and cold water. Avoid tea in any form.

To be avoided are spices, peppers, condiments, olives, pickles, cheese, and lobsters.

Penzoldt's diet list is generally used because it is practical:

7 A.M. A glass of cold water.

8 A.M. A liberal breakfast, with sweetened coffee, a good deal of butter, honey and Graham bread, after which the patient should go to stool.

1 P.M. Midday meal of meat, a good deal of vegetables, salads, stewed fruits, half a bottle of light wine or cider if desired.

7 P.M. Meat, with a good deal of butter, Graham bread, stewed fruit, and beer.

10 P.M. Before retiring, fresh or stewed fruits.

TROPICAL DYSENTERY.

The *Lancet* of December 1, 1906, contains an article on this subject by BLACKHAM, in the course of which he says that in approaching the important subject of the treatment of an acute illness, such as dysentery, it is best to divide remarks under different headings indicating the therapeutical lines on which treatment is based. The indications which will assist us in the treatment of dysentery are five in number: (1) to relieve the pain and tenesmus; (2) to avoid all irritation of the inflamed mucous membrane; (3) to promote intestinal antisepsis by removing foul accumulations and arresting putrefaction; (4) to counteract any morbid agency in the blood as far as may be; and (5) to support the patient's strength by suitable diet. Let us consider these indications.

First, to relieve the pain and tenesmus. As the use of opium has been unhesitatingly condemned by the older writers in the treatment of acute dysentery, the evidence of Washbourn and Faichnie is of value as expressing the most recent views on the subject. Washbourn goes so far as to say that he has seen lives saved in South Africa by the introduction of a morphine suppository, so there is now no doubt that the first indication of the treatment of acute dysentery is to give opium in some form or other, not to act as an astringent but simply to moderate and control the painful contraction of the intestines, which produces what is known as tenesmus. Yeo suggests that the drug should be given in the form of an enema, and recommends the administration of 15 minims of the tincture in an ounce of cold mucilage of starch. It must, however, be remembered that in dysentery the anal mucous membrane is intensely irritable, and the passing of a rectal tube may be the cause of great suffering, so that rather than resort to the device of brushing the entrance to the bowel with a solution of cocaine, as has been suggested by some writers, the author invariably prefers to give a quarter or a third of a grain of morphine hypodermically. He has found this effective in relieving both tormina and tenesmus, and this appears to be the treatment to be adopted on expeditions or in camp, when suppositories and material for enemata are rarely available. Dr. Amos emphasizes the utility of opium in an article just published in the *Lancet*.

Secondly, to avoid irritation of the inflamed mucous membrane. In this relation the author points out that many years ago Sir William Gull summed up the treatment of acute dysentery in three words, viz., "Rest, warmth, and ipecacuanha." This was not only smart and epigrammatical, but it had the advantage of being correct, and Washbourn, after his exceptional experiences in South Africa, has little to add to

the aphorism of the great Gull. To avoid irritation of the inflamed mucous membrane we must apply the first two of Gull's trinity of remedies. Rest is absolutely essential, and in all cases the patient should remain in bed and use a bedpan. The frequent stools and tenesmus soon produce coldness of the surface and extremities, so to maintain the individual's vitality he must be kept warm by means of plenty of blankets and hot-water bottles if necessary, and Yeo recommends that opium liniment should be gently rubbed into the abdomen. All foods which leave a residue prone to decomposition must be avoided, and Manson objects even to milk in acute dysentery if the tongue is foul and limits the diet to weak chicken broth, barley and rice water, with a little egg-albumen, till the tongue cleans. Milk is, however, considered the best food in all cases by Scheube and Yeo, while Osler recommends "milk, whey, and broths." In the author's experience milk can be taken if the stools are watched. It should be boiled or sterilized, diluted with almost equal parts of barley water, and rendered alkaline by the addition of five grains of bicarbonate of sodium or one drachm of saccharated solution of lime in each pint. If curds appear in the stools the milk must be peptonized to limit, so far as possible, the amount of undigested milk passing through the pylorus, but if, notwithstanding this precaution, curds are still present, then it is essential that milk should be given up and the diet limited to whey, broths, and egg-albumen. In all cases clear soups flavored with the juice of fresh vegetables can be given, as they leave no residue behind and are most grateful to the patient as a change from milk. Ewart and Nash very strongly recommend this kind of broth in the treatment of typhoid fever, and we may take it that in the acute stage dysentery must be treated on much the same lines as enteric fever. Nash says that "too rigid an application of the exclusive milk diet spells disaster in many cases. The author calls to mind more than one case of typhoid fever which has been admitted to hospital most desperately ill, not so much through the disease *per se* as through loading of the intestinal tract with massive milk curds producing both harmful toxins and mechanical irritation." Stimulants should not be exhibited as a matter of routine. As Faichnie points out, they are rarely necessary, and should only be given in small quantities when the prostration of the patient is very great. A teaspoonful of brandy in a teaspoonful of hot coffee is recommended by one authority.

The third indication for treatment is to attempt to produce intestinal antisepsis. This can, of course, be merely an attempt as the bowel may be regarded as a forest crowded with flora and fauna of the most varied and septic character, but although it may be useless to try to render the intestinal mucosa aseptic it may be possible to place it in a position which will discourage the growth of a delicate organism such as the bacillus of dysentery appears to be. There are three ways in which we may attempt to treat this indication: (1) by saline aperients, which sweep all foul accumulations and organisms from the intestinal tract in a more or less mechanical manner; (2) by the administration of certain drugs said to be specific; and (3) by washing out the bowel per anum by means of astringent and antiseptic fluids. In the tropics the best preliminary treatment for all cases of diarrhea is a dose of castor oil with or without from 15 to 20 minims of laudanum and spirits of chloroform, and Manson believes that slight cases of dysentery are often checked thereby and require no further treatment except rest and a bland, non-irritating diet for a few days. Having done this the physician must elect whether he will resort to the saline, specific, or lavage method of treatment.

With regard to the saline treatment this method has many adherents amongst officers of the Royal Army Medical Corps serving in India, and in most hospitals in that country one or other of the following mixtures is well known: (1) Magnesium sulphate, one drachm; tinctura zingiberis, ten minims; acidum sulphuricum dilutum. five minims; chloroform water, to make

half an ounce. (2) Sodium sulphate, one drachm; aqua fœniculi, half an ounce. The first is Buchanan's original formula, and the latter his modification on discovering that sulphate of sodium gave, on the whole, better results than sulphate of magnesium. The mode of administration is to give a tablespoonful of one or other of these mixtures every hour until the motions become fecal, and then every three or four hours for one or two days. If the stools become watery and show any tendency to take on a feculent character the saline treatment must be promptly stopped and the ipecacuanha resorted to, and the author points out that Washbourn, from his recent experience in South Africa, regards ipecacuanha and magnesium sulphate as both specifics for the disease, but he regards ipecacuanha as the most efficient, as he has seen it cure cases in which magnesium sulphate had failed. Personally, the author always starts with the saline treatment when he can rely on the patient being efficiently nursed and the character of the stools intelligently watched, but in other cases he resorts to ipecacuanha, which he considers almost a specific for the disease.

SOME FUNDAMENTALS IN HYDROTHERAPY.

In the *Boston Medical and Surgical Journal* of November 29, 1906, NICOLA writes a paper with this title. He says that the symptom for which most patients urgently demand relief is pain, and anodynes constitute the principal weapon in the medicine case of the physician; yet every physician, no doubt, has experienced a moral qualm at being compelled to use them. While it must be admitted that anodynes are of great service to the practitioner in extreme cases, and their use could hardly be dispensed with entirely, yet it is probably true that nine-tenths of the minor aches and pains for which anodynes are promptly given could be controlled by less harmful means. Pain may be either of a congestive or neuralgic nature. When of the congestive type, cold is indicated to relieve the congestion. Cold compresses to the head, in conjunction with the hot foot or leg bath, will promptly relieve a congestive headache. Pelvic pain, due to congestion, may be relieved by the ice-bag applied to the hypogastrium in conjunction with the hot hip and leg pack. Often after laparotomy for pelvic operations when it is undesirable to use morphine, the author has seen the pain caused by the reactionary congestion of this region greatly relieved by a hot leg pack, which draws the blood away from the pelvis, accompanied by an ice-bag placed between the thighs, which by reflex contraction of the blood-vessels further tends to relieve the pelvic viscera.

Pain of a neuralgic character, on the other hand, calls for heat. Neuralgia is the cry of the nerves for blood. Heat increases the blood-supply. The best means of applying such heat locally is the very hot fomentation. The author has observed the most magic results follow this simple procedure, when properly applied. It is seldom that a pain is encountered that may not be promptly relieved by some application of heat. Deeper seated and more extensive pain, as lumbago, sciatica, etc., when not relieved by simple application of heat, may almost invariably be dispelled by the Scotch douche, consisting of a local douche of considerable force, as hot as the patient can endure, applied for two to four minutes, and followed by a cold jet for a few seconds. In private practice the hot pour may be substituted for this by placing the patient in a bath tub, and letting water fall for some distance upon the part treated. Pain in the pelvic region can, in many cases, be relieved by the hot enema, repeated if necessary. A short, very hot, sitz bath (112° to 120°) is a most excellent means of relieving chronic pelvic pain. It should be continued six to eight minutes, and instantly followed by a dash of cold water on the hips.

Constipation is a symptom which affords an excellent illustration of the utility of hydrotherapy. Already the enema is coming into general favor in preference to irritating cathartics as a means of palliating this symptom. The author has not infre-

quently seen trouble cured, moreover, by the simple expedient of injecting into the bowel a glassful of cold water on rising, to be retained until after breakfast. The stimulating effect of cold water on the peristaltic action of the colon is sufficient to produce a natural action of this organ; and in the course of one or two weeks the enema can be dispensed with, the bowel having regained its normal activity. The enema habit may also be broken off, in those accustomed to large warm enemas, by lowering the temperature of the water each day five degrees, and lessening the amount one-half pint. The peristaltic action may also be stimulated by hot and cold applications over the abdomen; also by hot and cold applications over the liver to increase the flow of bile. By massage and abdominal exercises the action of the intestines may be mechanically assisted, while the sinusoidal current is of the greatest assistance in stimulating a normal activity. By the use of these and many other physical applications which modern science affords this symptom in its most obstinate form may be radically cured without resorting to purgatives, which irritate and derange other parts of the digestive tract, and which at best tend to fasten on the patient the cathartic habit.

The last symptom which the author uses to illustrate the value of hydrotherapy is one which is only too often met in these days of increasing nervous trouble. He refers to insomnia. In this, as in all symptoms, a course of rational treatment will be directed to the cure of the fundamental condition of which this symptom is a part. But among the palliative measures he takes time to refer to but one or two of the most useful. Neutral applications have a decidedly quieting and calmative effect upon the nervous system. Where insomnia is due to nervous irritability, it is often truly gratifying to witness the transformation in the patient under the influence of a neutral bath. This bath, which may be given in any modern household, consists of a full bath at the temperature of the skin. The temperature of the water should be kept within the limits of 94° to 96°. Not infrequently the patient lapses from a state of almost intolerable restlessness into a state of repose and even quiet sleep while still in the bath. The neutral bath should always be continued for a considerable time: never less than one-half to three-quarters of an hour, and from that to an hour and a half or two hours, if necessary, in order to get the desired and lasting result. Another exceedingly sedative application is the wet-sheet pack, continued to and prolonged in the neutral stage. The author has more than once seen the victims of insomnia pass into a quiet sleep while snugly enveloped in this application. Where the symptom is a result of cerebral congestion, derivative applications, as the warm leg bath, will often produce the most happy results. The wet girdle applied to the abdomen and covered with flannel and mackintosh acts not only as a partial pack and nerve sedative, but, by dilating permanently the abdominal vessels, helps to relieve the cerebral congestion. Without referring to special cases the author can state that he has used these and other hydriatic methods with the most gratifying results in the treatment of hundreds of cases of insomnia accompanying almost every form of nervous disorders, from simple neurasthenia to cases of nervous exhaustion bordering on mania. In all these cases the hydriatic treatment is accompanied by other physiological methods, such as electricity, massage, mechanical vibrations, careful attention to diet, etc., all of which are necessary in the reconstruction of chronic invalids.

THE INTERFERING ACTION OF DRUGS IN THE CLINICAL EXAMINATION OF URINE.

The London *Lancet* of November 24, 1906, says that the difficulties attending the clinical examination of urine through the interfering action of various drugs are dealt with by M. J. Bonores in a recent number of the *Gazette Hebdomadaire des Sciences Médicales de Bordeaux*. Thus in the search for indoxyl-sulphate of potassium in the urine of a patient undergoing treatment

with iodides the addition of hydrochloric acid and chloroform in all cases gives a positive reaction, as the chloroform is tinted violet by the liberated iodine. It has been shown by Professor Denigès that the addition of a crystal of sodium hyposulphite destroys the color due to the iodine without affecting the indigotine. The determination of the xantho-uric bodies in urine is rendered inaccurate when the patient is taking theobromine, caffeine, rhubarb, or iodides. In the case of theobromine the error is due to the fact that in the presence of ammonia and a magnesium salt an insoluble compound of silver and theobromine is formed on warming. Caffeine gives a similar reaction, and the color of rhubarb interferes with the usual tests. The search for albumin is hindered when methylene blue, balsam of copaiba, tincture of myrrh, terpin hydrate, and urotropin are given as medicines. Thus, methylene blue yields a precipitate with Esbach's reagent, owing to the action of picric acid on methylene blue. In the case of balsam of copaiba it is impossible to examine urine for albumin with nitric acid, as the whole precipitate, including albumin and resin, is dissolved in the alcohol which is added to dissolve the resin alone. The oils of sandalwood and turpentine act in a similar manner. When these drugs, as well as cubebs and coal-tar, are given internally, chromic acid gives a precipitate even in the absence of albumin. But the addition of strong alcohol removes this source of error by dissolving the precipitate. After a patient has been taking tincture of myrrh for several days the urine gives on boiling a false indication of the presence of albumin, and the addition of nitric acid leads to a similar error in the case of terpin hydrate. When bromine water is added to an albuminous urine a yellowish precipitate is produced; urotropin also gives an orange-yellow precipitate with bromine water. These apparently similar results may be distinguished by warming the urine, when an albuminous precipitate forms a coagulum, whereas a urotropin precipitate is dissolved. The determination of glucose in urine by the method of polarization may be patrially or totally negatived by the presence of arbutin, peptones, quinine, benzosol, and other levogyrate substances. Such urines do not reduce Fehling's solution. When urines are colored by the administration of methylene blue the determination of the sugar present by the saccharimeter is rendered very difficult. The color should be destroyed by the addition of nitrate of mercury, or better by filtration through 5 or 6 per cent of animal charcoal.

LYSOL POISONING.

In recent times over 100 cases of lysol poisoning have taken place each year in Berlin. The poisoning has awakened considerable interest, partly because the toxicology opens up the study of a whole group of substances which are chemically related to carbolic acid. Lysol is a solution of cresol in soap; it is produced by mixing oil of tar with linseed oil or with a fat and saponifying the mixture with caustic potash and alcohol. F. Blumenthal deals with this subject in the *Deutsche medicinische Wochenschrift* of August 9, 1906. Lysol contains about 50 per cent cresol, and the latter represents a methylated phenol having the composition $C_6H_4CH_3OH$. The principal toxicological action of carbolic acid is accepted to be caustic, and the second action is that of a nerve poison. The caustic action of lysol is also seen in lysol poisoning, and Blumenthal reports a case in which extensive ulcerative destruction was seen in the esophagus, stomach, and intestines. As a rule, however, the pathological changes after poisoning with lysol are slight, as evidenced especially in experimental poisoning in dogs; here the mucous membranes generally only show some hyperemia. The amount of destructive damage is usually too slight to account for death, and one has therefore to regard lysol chiefly as a nerve and heart poison.

With regard to the lethal dose for man, the author says that the statements in the literature on the subject are not to be relied upon. One author believes that 60 grammes can be withstood, and another gives the

maximum dose as 25 grammes. The reason why these figures are of no importance is that it is not the amount which has been swallowed but the amount which has been absorbed which decides. In one case a woman drank about 50 cubic centimeters of a concentrated solution of lysol, but he was able to show that only about 7 grammes was absorbed. The patient recovered after her stomach was washed out, some two to three hours after taking the poison. In three other cases he was able to determine that from 24 to 30 grammes of lysol were absorbed. All the patients recovered in response to the washing out of the stomach. Phenol is eliminated by the kidneys as phenolsulphuric acid and glycuronic acid. Both of these substances are greatly increased in the excretion stage of lysol poisoning. Free cresol is never excreted. Glycuronic acid is derived from the albuminous bodies, and may be regarded as a protection product. It is relatively harmless. In forty-eight hours the toxic agent has been transformed into this comparatively safe substance. The symptoms pass off even more rapidly, and it may be said that if consciousness does not return in from three to twelve hours the prognosis is very bad. Blumenthal shows, on the strength of some animal experiments, that the lysol acts toxically on the cells of the organs and not on the blood, and that the protective products are formed in the liver and in the brain. He has inquired whether the glycuronic acid, which he regards as an antitoxin, is produced in excess of the lysol, and finds that this is so. The lysol enters the cell by passing into the lipoid substance; the cell then forms sulphuric acid and glycuronic acid out of its carbohydrate and albumen store in excess. The action of the lysol depends on the amount of cells attacked.

In turning to the treatment, Blumenthal places washing out the stomach first. This should be carried out within two or three hours of the swallowing, and must be continued until the washings no longer smell of lysol. He then pours in about 1¼ pints of milk. Since cresol has an affinity for fats, it is better to wash out the stomach with cream. For the heart, stimulants should be given, but neither ether nor camphor should be used. Digalen answers extremely well for this purpose. In conclusion he points out that lysol poisoning has an advantage over the majority of poisons taken for suicidal purposes; if it does not end fatally, it rarely leaves any of those terrible effects behind which one meets with after caustic or acid poisoning. —*British Medical Journal,* Dec. 1, 1906.

THE USE OF DIGITALIS IN VALVULAR DISEASE OF THE HEART.

COLBECK in the *British Medical Journal* of December 1, 1906, asserts that it seems hardly possible to resist the conclusion that the primary and essential feature in the production of dilatation and failure of the heart is a decrease, either absolute or relative, of the cardiac tonus.

The influence exerted by digitalis and its allies on the cardiovascular system may be briefly stated to be a persistent and well-marked increase in the tonic contraction of the muscular tissue of the heart and arterioles whereby (that is, on mechanical and dynamical grounds apart from neuromuscular and other considerations) the action of the central organ is rendered more deliberate and at the same time more powerful and effective. The author wishes more particularly to draw attention to the fact that digitalis increases the cardiac tonus in a very remarkable manner, and although the tonus of the systemic arterioles and capillaries is simultaneously augmented, the balance of advantage, provided the cardiac parietes remain healthy, must always be with the heart, and this is more especially the case when the organ has undergone hypertrophy.

In aortic incompetence the left ventricle has to withstand during its diastole the distending effects of the regurgitated blood-stream under the pressure of the arterial recoil. The total intraventricular pressure during diastole on a unit of surface is the resultant of the respective pressures which prevail at the aortic and mitral orifices, and is of course enormously in excess of the

normal. The magnitude of the pressure that is exerted by the arterial recoil is more readily appreciated under experimental conditions, for it has been shown in animals that if the aortic valve be suddenly rendered incompetent the aortic pressure is sufficient to produce aneurism, or even rupture of the wall of the unprepared heart.

The strain imposed on the wall of the ventricle under the conditions ordinarily connected with the incidence of aortic incompetence comes into operation gradually, and its magnitude is ultimately determined by the extent of the lesion and the state of the arterial blood-pressure, but in any event it constitutes the chief source of overwork which has to be performed by the heart. It is of course obvious that the resistance to progressive and unlimited diastolic distention of the left ventricle in aortic regurgitation must be and is provided by an increase of the tension of the muscle fibers of the ventricular wall, and this is initiated and regulated by the cardiac tonus. Did the regurgitant stream distend the ventricle "while it is relaxed and defenseless in diastole," as is so often stated, there would be little further to say about aortic incompetence. Fortunately, the heart is enabled to fall back on a second line of defense—to wit, the cardiac tonus, which, assuming valvular functions, staves off unlimited dilatation and maintains more or less adequately the systemic blood-pressure. Dilatation would quickly get the upper hand of hypertrophy at the outset were it not that the ventricle falls back on its reserve power, which temporarily wards off the distending effect of the lesion. This increased display of functional activity leads, under favorable nutritional conditions, to hypertrophy, which restores and maintains the tonus of the ventricular wall up to the level of the requirements that are demanded by the increase of intraventricular pressure. There is no doubt a further cause for hypertrophy in that the ventricle has to propel a greater quantity of blood at each systole; but this factor must be unimportant compared with the task of maintaining the tonus of the cardiac wall.

From a theoretical standpoint the action of digitalis would appear at first sight to afford promise of considerable assistance in the treatment of aortic insufficiency, but a very little consideration is sufficient to banish this expectation.

In uncomplicated aortic incompetence, under the most favorable conditions of establishing compensation, the left ventricle is working in the face of diminished reserve power, and, consequently, of a lessened margin of safety. The exhibition of digitalis would no doubt augment the tonus of the ventricular wall, but concurrently the tonus of the peripheral vessels is heightened and the length of the diastole increased. Provided the cardiac parietes were sound, and so long as the conditions of the circulation were fairly equable, the balance of advantage would doubtless rest with the heart, but the introduction of any further strain, in the shape of nervous or physical exertion and so forth, might seriously imperil or even overcome the integrity and resistance of the ventricular walls. The concomitant pressure of mitral incompetence would sensibly diminish the risk of a cardiac breakdown, by enabling the distressed ventricle to discharge part at least of its contents along the path of lesser resistance provided by the imperfectly closed auriculoventricular opening. The administration of digitalis is absolutely contraindicated by the presence of degeneration or disease of the ventricular wall.

On the other hand, it is readily conceivable that in the course of aortic incompetence a comparatively sound ventricular wall may be temporarily overpowered by exposure to inordinate extraneous strain, such as may be entailed, for instance, by undue physical exertion, intercurrent disease, and so forth; under circumstances of this kind digitalis should be invaluable for the purpose of restoring the vigor of the heart. The simultaneous action of the drug on the right side of the heart is not without influence in the restoration of compensation; but the consideration of the operation of this factor, which is not altogether favorable in aortic disease, will be

discussed by the author at another time under the head of mitral incompetence.

In practice, then, it may be inferred that digitalis should seldom, if ever, be given in cases of aortic regurgitation which have developed during or after middle life, since the ventricular wall is seldom perfectly sound under these circumstances, and never in cases which give evidence of myocardial degeneration or disease. If complete rest is obtained, digitalis is permissible and beneficial up to a certain point in young, otherwise healthy adults showing signs of circulatory failure, more especially when the aortic lesion is combined with mitral incompetence. The drug should be discontinued for some time before exercise is resumed, and for reasons which the author has already advanced this rule should be rigidly observed. Neglect of this precaution might be followed by rapid failure of the ventricle and sudden death.

MALARIAL HEMOGLOBINURIA.

In concluding quite an exhaustive article on this subject in the *Journal of the American Medical Association* of December 15, 1906, BREM states that the treatment he pursued can be summed up practically in one word—quinine. In every case the drug was administered by intramuscular injections, and in every case, including the fatal ones, hemoglobinuria or blackwater disappeared with greater or less rapidity, and recurred only in the cases that received the smaller quantities. Albuminuria also rapidly decreased. Morphine was used freely with quinine to allay restlessness and vomiting and to lessen cinchonization.

Two methods of treatment were used. The first five patients were given 10 or 15 grains of quinine intramuscularly every four or six hours for varying lengths of time, usually covering forty-eight hours, and then 5 grains by mouth every four hours, except in one case. The next eight patients received 10 grains intramuscularly at 8 and 10 A.M. daily as long as indicated by vomiting or by the general condition of the patient, and then 30 grains by mouth given in broken doses before 12, noon, daily. The last patient received 20 grains intramuscularly on the evening hemoglobinuria developed, 20 grains intramuscularly the following morning and again in the afternoon, and 30 grains intramuscularly the third morning. The number of cases is too small to allow conclusions to be drawn from the mortality. There was one death in each group of cases. Theoretically, if quinine as an etiologic factor has been excluded, the first method should be of greater value. The cases in which recovery took place under it (except one case) ran a milder course and appeared to lose less hemoglobin than those treated by the second method. In none of this group did hemoglobinuria or blackwater recur after its first disappearance. In the second group hemoglobinuria recurred in four cases, in two of which there were three recurrences. Further, a case of algid pernicious malaria was admitted to the ward at 9 A.M. A moderate number of estivo-autumnal parasites were present in the peripheral blood. He received 10 grains of quinine intramuscularly at 10 A.M. and 12 noon, and the same dose at 8 and 10 A.M. on the following day. On the morning of the third day the author was able still to find parasites in the peripheral blood. If hemoglobinuria is caused by the estivo-autumnal parasite, it seems certain that the small doses are not sufficient to destroy the organisms in a minimum length of time, every hour of which counts in the saving of so much blood for the patient.

The author believes that the best results will be obtained by administering 10 grains of quinine intramuscularly every four hours during the first forty-eight hours, or 15 grains may be well substituted for the first three or four injections. By this means a strong solution of quinine in the blood can be maintained during the cycle of development of the estivo-autumnal parasite, and all parasites will be subjected to its influence at some time during the cycle when they are most susceptible to the action of quinine. After forty-eight hours the dose

may be reduced and given by mouth if vomiting does not forbid.

Two different preparations of quinine were used for intramuscular injections, the bihydrochloride and the bimuriate with urea. Extensive necrosis and suppuration in two cases followed the use of the former preparation, while only a few superficial necroses occurred after the latter. In eight of the cases the two preparations were alternated, and with one exception the bihydrochloride proved less irritating. The solution of bihydrochloride used in the two cases of extensive necrosis did not contain an excess of hydrochloric acid, and there was a precipitate in the bottle. The addition of a small amount of sodium bicarbonate to a portion of the solution caused a heavy precipitation. It is probable, then, that the alkalinity of the tissues caused a partial precipitation of quinine at the sites of the injections and that necrosis of the tissues and infection followed. Later solutions containing an excess of acid were used, and the results from these solutions have been definitely superior to the results from solutions of the bimuriate and urea. The strength of the latter solutions was 1 to 12; the strength of the solutions of bihydrochloride from which the best results were obtained was 1 to 3. The bihydrochloride has the additional advantage of being much more easily administered.

THE BLOODLESS METHODS OF ARTIFICIAL DILATATION OF THE CERVIX UTERI AT FULL TERM.

LEWIS (*Surgery, Gynecology, and Obstetrics,* December, 1906) states that in looking over the literature of the last few years he concludes that the advocates of the branching metallic dilators, especially the Bossi type, have not made out a case. All the branching instruments are complicated and composed of a very large number of parts. All are dangerous as carriers of infection, because all are difficult to clean. Most of them depend for the dilating force upon a screw at the end of the instrument—usually eight or ten inches distant from the dilating tissues. Various rules are promulgated by various authorities about taking so and so many turns of the screw in so and so many minutes, waiting so and so long before screwing up again, and otherwise doing things by rote. The great fault of all is that the intelligence of the operator has to pass through so much mechanism before it reaches the tissues. It is impossible, at the end of a complicated instrument worked by a finely threaded screw, to have any adequate idea of how much force is being exercised upon the tissues of the os and cervix. Many authors state that the os must be tense, others that it must be loose. In reality, that excessively rigid os about which we hear so much and see so little is extremely rare. When it does exist, there is no method of the bloodless variety which can dilate it without great danger of serious lacerations. Here is the place for one of the bloody measures. The consistent and careful use of the bags, or, if more haste is demanded, the bimanual method, will overcome the other cases about as quickly as the Bossi method, and always more safely.

Bardeleben's examinations prove that far more lesions follow the method of Bossi than follow labors where that method is not employed. The large and growing number of authorities, especially in Germany, who are coming out from the glamor of Leopold's enthusiasm, and who are reporting failures with the Bossi method and serious lacerations following it, are continually furnishing more and more evidence against it.

PUERPERAL INFECTION—USE OF COLLARGOL INJECTIONS.

The results obtained by BONNAIRE (*Presse Médicale,* No. 93, 1906) were very favorable, although as the method was only used in the most severe cases the mortality was high.

The substance has been used by the mouth, the rectum, hypodermically, and intravenously. The last is the most effective

and was used by the author. The hypodermic method is to be avoided on account of the pain and the tendency to abscess. By the mouth it is perhaps ineffective. It may be used in chronic cases by means of inunctions (as unguentum Credé). It is also useful locally in various infections—*e.g.*, purulent ophthalmia, and as one-per-cent solution as a douche in vaginitis. The best method of using it in puerperal infection is by injection in the veins near the elbow, the needle being inserted directly into the vein without its being exposed by incision. Sterilization of the solution is unnecessary, as it is strongly antiseptic, 1/4500 killing streptococci. The average intravenous dose is 10 cubic centimeters of a one-per-cent solution. It is necessary to be careful not to inject air as the solution froths easily. Strong solutions are of no advantage. After the injection there is some fever, rarely high, which may be preceded by a chill, and is followed by a sense of well-being. The chill is important, being absent in those cases which are likely to end fatally, and strongly marked in favorable cases unless a chill has occurred just before the injection. The chill only follows the first injection; the fever occurs after each. The results obtained were good. There is no tendency to cause argyria, although excretion is slow and mainly through the bowel.

MOVABLE KIDNEY—RESULTS OF NEPHROPEXY.

The disputed point whether nervous symptoms occurring in persons with movable kidney are likely to be relieved by nephropexy is considered by DOERING (*Deutsche Zeitschrift für Chirurgie*, lxxxiv, 1906).

The methods of attaching the kidney to the abdominal wall are numerous, but all may be divided into three groups: (1) Those in which the capsule is split and sewed to the abdominal muscles; (2) those in which the capsule is sewed to the diaphragm; and (3) those in which silver wire is passed through the lower end of the kidney and around the lowest rib. The last method is supposed to allow the organ to make its normal excursion with the diaphragm. All authors, with the exception of Küster and a few others who use the last method, report that although the attacks of renal colic are permanently relieved by the operation there is little effect on the nervous symptoms. Küster, however, claims to relieve a large proportion of these cases also. Doering, who uses the first method, finds that the kidney is kept permanently in place after the operation, but in spite of this there is little effect on the nervous symptoms, and as his figures agree with those of all authors excepting Küster, he assumes that Küster is too sanguine in estimating his cured cases. The difference in result cannot be due to difference in technique, as the kidneys operated on by Doering show no tendency to again become movable.

MYOSITIS OSSIFICANS CURED BY THIOSINAMINE.

Having obtained good results from thiosinamine in apparently hopeless cases of keloid, scars from burns and *x*-rays, and in urethral strictures, BOSECK (*Münchener medicinische Wochenschrift*, No. 48, 1906) tried it in a case of myositis ossificans with good results.

The patient showed no symptoms except loss of power in the muscles of the right shoulder and left side of the neck, and loud cracking noises on moving the parts. In the right sternomastoid a bony mass was felt. Injections of 1½ grains were given daily for a month, by which time the symptoms had entirely subsided.

CHLOROFORM-OXYGEN ANESTHESIA AND PNEUMONIA.

In a series of experiments on rabbits LICHTENBERG (*Münchener medicinische Wochenschrift*, No. 47, 1906) found that inhalation of chloroform could of itself cause pneumonia. The amounts administered were so large that the results can hardly be applied to ordinary surgical anesthesia.

A very important point, however, was

discovered, namely, that administration of oxygen with the chloroform led to shallow respiration on account of the saturation of the blood with oxygen, and this in turn led to disuse of part of the lung, with a tendency to stagnation of air saturated with the anesthetic, and thus to a prolonged action of the poison on certain parts of the lung, the resistance of which was further lessened by poor blood supply following reduced activity. Lichtenberg therefore advises against the use of oxygen as a carrier for the chloroform, believing that pneumonia is more frequent with it than with air.

PUERPERAL ECLAMPSIA—TREATMENT WITH PARATHYROID EXTRACT.

Having found that the parathyroid glands were abnormally small in several women who died from eclampsia, VASSALE (*Münchener medicinische Wochenschrift,* No. 48, 1906) removed the parathyroids of mice and cats and found that typical convulsions occurred. The same phenomena were seen in dogs, and were relieved by the internal administration of parathyroid gland, without which all died. Albuminuria and occasionally anuria accompanied the convulsions. A condition resembling puerperal eclampsia was produced by ligation of the ureters after removal of the parathyroids. Vassale believes that eclampsia is due to insufficiency of the parathyroids associated with interference with the renal function through pressure of the gravid uterus on the ureters.

EXTENSIVE LUMBAR ANESTHESIA.

It is possible, according to DONITZ (*Münchener medicinische Wochenschrift,* No. 48, 1906), to extend the anesthesia to the upper part of the chest and even to the arms without danger if tropacocaine is used instead of novocaine or stovaine, which have more effect on the motor roots and thus are likely to cause paralysis of respiration if pushed too high. Tropacocaine has almost no paralytic effect on the motor roots.

The extension upward of the anesthetic effect is due to the flowing upward of the liquid in which the anesthetic is dissolved, and this occurs by flowing of the cerebrospinal fluid and not by diffusion. If therefore we wish to extend the effect upward we cause this fluid to flow upward after making the injection. There are three ways of doing this: (1) By changing the position of the body so that the head is lower. The injection being made in the sitting position, the horizontal or the elevated pelvis position is then assumed, and the fluid flows upward by gravity. (2) By lessening blood-pressure in the brain, thus lessening meningeal pressure and drawing fluid from the cord. This may be done by putting a bandage around the neck a few minutes before giving the injection and removing it after. The opposite action is sometimes seen when persons with heart disease are put in the elevated pelvis position. There is congestion of the brain and a flow of fluid downward, which reverses the usual effect of elevating the pelvis. Deep respiration also causes a lessening of blood-pressure in the brain and draws fluid upward in the canal. (3) Increase in the amount of fluid injected.

Vomiting also causes anemia of the brain and an extension upward of the effect. Vomiting is not due to any local action, but to general effect from absorption, and bears relation to the amount of anesthetic used rather than to the extent of the anesthesia. The effect is more pronounced and more lasting in old persons, and they are therefore not adapted to high anesthesia; children, on the contrary, are more prone to symptoms of general intoxication from absorption. The usual dose is 5 centigrammes dissolved in 1 cubic centimeter of water. This solution is isotonic. If this is injected undiluted in the horizontal position there is anesthesia of the perineum only; if in the sitting position with change to horizontal the legs are also affected; if the pelvis is elevated there is enough anesthesia for herniotomy. If the syringe is drawn out and filled with 10 cubic centimeters of cerebrospinal fluid, thus diluting the anesthetic before injecting it, the effects under previous conditions reach to the groin, the

umbilicus, and the arms respectively. When the effect reaches the chin the pelvis must be lowered. The neck-band and the deep respiration extend these effects slightly. For anesthesia of the upper part of the body and for labor cases tropacocaine is preferable as it has almost no effect on the motor sphere. This effect makes stovaine better for the reduction of fractures and dislocations and for orthopedic operations.

BIER'S CONGESTION TREATMENT.

The benefit from this method of treatment is shown by HOMBERGER (*Archiv für klinische Chirurgie,* lxxx, 4) to be due to the increased flow of blood through the dilated veins and not to stasis.

It has been shown experimentally that the temperature of any part of the body as compared to another part is in direct relation to the amount of blood passing through it in a given time. The rise in temperature which accompanies Bier's congestion thus shows that circulation is accelerated, whereas in inflammation it is ordinarily slowed. The slowing can be shown by venesection to exist only in the very center of the inflamed area; the flow is more rapid in the neighboring parts. If there were stasis the temperature of the part would fall. The increased temperature increases combustion—that is, destruction of waste matter—and thus is of benefit. All methods which stimulate the local circulation—*e.g.,* heat and cold—have a similar beneficial effect.

NEVI AND ANGIOMATA—ELECTRIC TREATMENT.

Electropuncture is considered by ZIMMERN (*Journal de Médecine,* No. 52, 1906) the best treatment of superficial angiomata and nevi. He uses a high-frequency current and fine needles which must be insulated except near the point, as action on the skin itself will cause scarring. In cavernous angioma with dilated vessels the current is carried along these and the method of application is evident, but in flat, uniform nevi the application is more difficult. In most cases he begins at the edge of the spot, inserting one needle slanting away from the center of the nevus, and the other also at the edge and slanting parallel to it at a distance of one-fifth to one-half inch. The current is turned on for about a minute, and then one of the needles is moved to the other side of its fellow and inserted in the same way. This is continued until the entire mass is circumscribed, five to six applications being made at each séance. When the circumference has been treated the center is attacked. Four or five needles are connected with the positive pole and inserted at equal distances around the edge of the mass, and one needle connected with the negative pole is placed in the center. The current is then turned on and continued until a grayish discoloration is noticed around the needles, generally at the negative pole first. This is the sign for immediate cessation of the séance. The strength of the current should not be more than 60 milliamperes nor less than 20, 40 to 50 being the best. The pain may be considerable, but anesthesia is rarely required. Pain may ordinarily be prevented by turning the current up to 60 instantly and reducing it rapidly to the desired strength. The treatment is indicated in all superficial angiomata and nevi.

ANESTHESIA—PREVENTION OF VOMITING.

After a number of vain attempts to find a means of preventing the nausea and vomiting which so often follow the use of ether and chloroform, WANIETSCHECK (*Prager medicinischer Wochenschrift,* No. 50, 1906) discovered that the internal use of alypin, one of the newer local anesthetics, would entirely prevent it.

Just before beginning the administration of the anesthetic the patient is given 5 to 6 drops of a five-per-cent solution, and this dose is repeated as soon as the patient is sufficiently recovered to swallow. This usually prevents all nausea, but if there is a tendency to it the dose may be again repeated in one or two hours.

BRAIN INJURY—INDICATIONS FOR LATE OPERATION.

The indications for operative treatment of cases with brain injuries of long standing are considered in detail by TIXIER (*Revue de Chirurgie,* Nos. 10 and 11, 1906). In most cases of head injury with lesion of the brain there is necessity for immediate operation, but in some cases the signs of brain trouble do not show themselves until several months or even years after the injury. In this class of cases it is very difficult to decide how much benefit is to be expected from an operation.

As regards the history, the cases fall into three groups: (1) No sign of brain trouble at the time of injury; (2) temporary recovery from symptoms; (3) constant trouble, steadily increasing in severity and finally justifying operation, which is only indicated if the phenomena are severe enough to prevent earning a livelihood.

A symptom demanding operation is headache. This is ordinarily localized at the point of injury and made worse by pressure over this point. When it is the only symptom it rarely demands trephining. The usual line of treatment should first be tried, followed by lumbar puncture, and if this gives no relief, by incision of the scalp; free any adhesions to the periosteum of the skull and relieve pressure of scar tissue on cutaneous nerves. If the pain continues to be so severe as to prevent mental work, the skull may be opened. No one lesion of the meninges or brain has a particular tendency to cause local pain, but osteitis of the skull is the most frequent cause. The dura may be found thickened or pinched or merely adherent.

In cases of Jacksonian epilepsy or localized aura corresponding in location to a scar or sign of injury on the head, operation is clearly indicated.

In cases with Jacksonian epilepsy with no scar on the head, the localization may be more difficult, but the most puzzling cases are those in which the localizing symptoms point to a part of the brain other than that which shows the scar. In such cases it is ordinarily best to be directed by the symptoms rather than by the signs of external injury, as the lesion of the brain is often far away from the point of injury. If there are no localizing signs it is necessary to study the previous history of the patient for signs of a neuropathic tendency existing before the traumatism. If there is no such history and no nervousness between fits there is a good prospect of operation giving relief. It is claimed that nitrite of amyl inhaled will cause a fit in traumatic epilepsy and prevent one in idiopathic, but this is not absolutely true. The causation of a fit by vasodilators is, however, strong evidence of the attacks depending on a local lesion. In some cases relief of pressure by lumbar puncture will stop the spells, and this should be tried before any operation on the skull. Intellectual troubles which can be brought into positive relation to the injury are no bar to operation and are likely to be improved by trephining.

Great care must be exercised to distinguish between true traumatic lesions and traumatic hysteria. The latter shows a tendency to be worse on certain days, and if there is a contracture this will show the same peculiarity. The paralysis in hysteric cases is less definitely limited to one side and the reflexes are less affected. Localized paralysis points very strongly to a lesion of the motor cortex of the opposite side.

The characteristic change in lesions of the cortex is loss of stereognostic sense—that is, loss of the power to name an object held in the hand but not seen. There is no pain or thermal sense as a rule.

Loss of visual power in the same half of each eye, true hemianopsia, is ordinarily indicative of lesion in the occipital lobe. In some cases there is loss of color sense on one side, and this should be looked for if perception seems normal. Other changes of special senses are of less importance.

Pure motor aphasia is positive evidence of lesion of the island of Broca or lower part of the motor region.

When careful study of the symptoms indicates a lesion of a certain part of the brain, the skull should be opened. This is

best done by turning back a large flap of scalp and periosteum and boring small trephine holes at the corners of the proposed skull flap and connecting these with a wire saw.

If lesions sufficiently pronounced to cause symptoms are not found outside the dura this membrane should be opened by a large crucial incision. If any part of the cortex is diseased it may be removed without danger, but if it seems normal it is not justifiable to excise the part in which the trouble seems to lie. The operation being completed the dura mater should not be closed, as this is likely to lead to pressure from extravasated blood. A small opening should be left in the skull, and through this the dura and periosteum should be sewed together. This will prevent pressure symptoms following the operation. If the operation is not permanently successful a second and third may be performed, as there is no danger from the trephining if properly performed.

THYMUS STENOSIS AND DEATH DUE TO PRESSURE OF THE THYMUS GLAND.

A large hyperplastic gland in many cases is capable of exerting pressure upon the organs lying in the mediastinal space. This pressure is exerted in most cases upon the air-passages, less frequently upon the heart and large vessels. This condition of pressure has often been disputed, and in a careful and thorough work of FRIEDLEBEN it is asserted that "there is no pressure on the part of the thymus gland either upon the air-passages, vessels, or nerves." This was so generally accepted that in vain Virchow and Cohnheim demonstrated that pressure due to the thymus gland had sometimes resulted in death.

The tracheobronchial stenosis due to pressure by a hyperplastic thymus is a clinical and pathologically proven affection not to be confounded with spasm of the glottis. It occurs oftener than commonly supposed. The objective symptoms differ according to the degree of stenosis. There are transitions from an apparently harmless stridor of infants to a case of dangerous dyspnea with slow, suffocating death, or sudden death due to a total compression of the air-passages. The stenosis may make its appearance slowly or suddenly. It may recover spontaneously, or without warning become fatal. Even in the apparently harmless cases in which the patient seems to suffer no discomfort the prognosis must be very guarded, because a sudden, unexpected change in the disease may make conditions grave. The indication for immediate operation is when suffocating attacks occur. Time and experience will tell whether or not to operate prophylactically. An operation is directed to removing the obstruction.

If an ectopexia is not sufficient, the capsule should be incised and the gland removed, either partially or completely. An extra-capsular excision is anatomically not possible. The operations that have been performed so far have not only been associated with good results, but have been relatively simple and without danger. Anesthesia is neither necessary nor advisable. —*Archiv für klinische Chirurgie,* 1906; quoted from the *St. Paul Medical Journal,* January, 1907.

HIP-JOINT AMPUTATION.

CATES (*Surgery, Gynecology, and Obstetrics,* January, 1907) on the basis of five cases considers the safest and easiest method that by dissection, since it offers the best means of controlling the hemorrhage and the quickest method of effecting disarticulation. A circular incision is made through the skin six inches below the joint, and is extended up the outer side of the thigh over the great trochanter. The skin flap is dissected back to the point where the muscles are to be divided. The common femoral artery and femoral vein are separately ligated with two ligatures, and the vessels divided between them. This having been accomplished the knife is carried by a circular sweep down to the bone. The neck of the latter is cleared, and while an assistant alternately makes internal and external rotation the muscles attached to the

trochanters are divided. The capsule is opened in front, and the assistant pries the head out of the acetabulum while the operator carries the knife down behind the bone, completely dividing the capsule. A large counter-opening is made in the posterior flap through which a gauze or cigarette drain is carried, also one from each angle of the wound down to the acetabulum. The muscles are brought together by deep catgut sutures.

The cases reported by Cates were some of them such as afforded the most unfavorable prognosis. The first was a far-advanced tuberculous case, which lived seven months after operation. The second was one of lymphosarcoma. This operation was performed by the help of Wyeth's pins. The one on the outside of the thigh broke, resulting in a violent hemorrhage. The patient recovered from the operation, but died three months later from recurrence on the left side of the chest. The third was an instance of compound fracture complicated by rapidly spreading gangrene. At the time of operation necrosis had affected all the soft tissues of the entire limb, even extending up the hip and involving part of the abdomen. The day following operation the stump showed signs of necrosis, and was thereafter treated according to the open method. The patient recovered completely. The fourth patient was suffering from what seemed to have been an extension of tuberculosis of the femur with multiple sinuses. The amputation wound became infected and was treated by the open method. This patient recovered. The fifth case was an instance of tuberculous hip-joint with multiple sinuses and necrosing inguinal glands. The external iliac artery and vein were tied above Poupart's ligament, on account of the mass of necrotic tissue in Scarpa's triangle. Not only was the head of the femur eaten away, but the entire iliac bone, nearly to the crest of the ilium, was worm-eaten and rotten. The patient collapsed, was revived by hot saline solution in his veins, and lived for four days after operation.

REVIEWS.

GREEN'S ENCYCLOPEDIA AND DICTIONARY OF MEDICINE AND SURGERY. Volumes I, II, and III. From AAC to GUM. William Green & Company, Edinburgh and London, 1906.

This work, which as is seen from the alphabetical arrangement is just about half completed, is designed to be to medicine what the Encyclopedia Brittanica or any other well-known encyclopedia is to ordinary learning. The authors who have contributed to it are all of them recognized as occupying authoritative positions in England, and their contributions are in the great majority of instances excellent and reliable. The illustrations are very much better than are usually found in books of this character, both those in colors and those in black and white plates being unusually well executed. Each volume contains a little over five hundred pages, and is bound in a durable cover. We note with interest that the author of the article on Diphtheria states that 1500 units of antitoxin are sufficient if the disease is treated on the first day, and that it will usually be unnecessary to give more than 2000 under these circumstances, whereas if the treatment is not instituted on the first day the amount must be increased up to 8000 or 10,000 units, and he himself has not rarely administered from 30,000 to 50,000 units, although he states that 16,000 units is about the limit for use in the first twenty-four hours.

THE INTERNATIONAL MEDICAL ANNUAL. A Yearbook of Treatment. E. B. Treat & Company, New York, 1907.

This Medical Annual, which has now reached its twenty-fifth year, has come to be recognized by the medical profession in England and America as affording a val-

uable summary of much of the literature of medicine during the year. It is not possible in the small amount of space which exists between its covers to give exhaustive consideration to the numerous important papers which have appeared—only a brief résumé of most of them is to be found. The first part consists in a brief therapeutic summary by Charteris, which covers a little over forty pages. This is followed by an article by Dr. Emanuel upon Opsonins, and again by one upon Electro-Therapeutics and Radio-Therapeutics by Dr. Morton, of London. Then follows a general consideration of medical literature as we have described it, including all branches of medicine and surgery. Scattered through the volume are a number of excellent colored plates, of which the best are those of Molluscum Contagiosum and one showing Lichen Planus. In the article on Plague a good deal of space is devoted to the importance of the rat, and the fleas which it bears, in the dissemination of the bacillus of this disease. The black and white illustrations, some of which are in the form of plates, are unusually good. A very interesting colored plate is that showing the Spirochæta Pallida stained by Levaditi's method. Altogether the Medical Annual for 1907 certainly upholds the reputation of the earlier volumes.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by H. R. M. Landis, M.D. Volume I, 1907. Price, in paper binding, $6.00 for the four issues.

This, the March issue, the first volume of Progressive Medicine for 1907, deals with a number of important departments in medical science. A large number of pages are devoted to the surgery of the head, neck, and thorax, by Dr. Charles H. Frazier. His article is one which should be in the hands of every active practitioner of surgery, and many of the papers and results quoted have an important bearing upon the methods of procedure which should be resorted to in the presence of traumatism and disease. Dr. Robert B. Preble in his article upon Infectious Diseases, including acute rheumatism and croupous pneumonia, points out, amongst other important matters, the necessity of carrying on the campaign against the house-fly, the bedbug, and the flea, as well as the mosquito, if we are to prevent the spread of disease. In Dr. Crandall's article upon Diseases of Children he points out that one of the most important factors in the morbidity and mortality of childhood is the ignorance of young mothers in regard to their duties in the rearing of children, and this ignorance is often found most marked in those who are most skilled in arts, letters, and science. Dr. Kyle writes upon the subject of Laryngology and Rhinology, both with reference to local applications and surgical operations, and Dr. B. Alexander Randall, Professor of Otology in the University of Pennsylvania, discusses the advances made in otology during the past year.

PRINCIPLES AND APPLICATION OF LOCAL TREATMENT OF DISEASES OF THE SKIN. By L. Duncan Bulkley, A.M., M.D. The Rebman Company, New York, 1907. Price $1.00.

This small octavo volume of less than 150 pages does not pretend to be a complete treatise on local treatment of diseases of the skin. It is, on the other hand, a condensation of four lectures given to practicing physicians in the New York Skin and Cancer Hospital in the spring of 1906. The book contains a number of prescriptions indicating the methods employed by Dr. Bulkley in his treatment of various dermatological states.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by A. O. J. Kelly, A.M., M.D. Volume IV, 16th Series, 1906.

In the pages which are devoted to treatment in this issue of the International Clinics we find an article by Dr. Rhein upon Electro-Therapeutics, one upon the Prevention and Treatment of Chronic Nephritis by Dr. French, another upon

Constipation by St. Steele; a fourth upon Obesity by Dr. Grocco; and last of all one upon the Non-operative Treatment of Renal and Urethral Calculi causing Colic by Lilienthal. These four articles take up 70 pages. The remaining 220 pages in the book deal with various subjects in medicine, surgery, obstetrics, gynecology, laryngology, and otology, the article upon otology being by Dr. Richardson upon "Mastoid Operations," while that on laryngology is upon the "Laryngological Complications of Pulmonary Tuberculosis" by Dr. Trevelyan, of London.

THE TOXINS AND VENOMS, AND THEIR ANTIBODIES. By E. Pozzi Escot. Translated by Alfred I. Cohn. John Wiley & Sons, New York, 1906. Price $1.00.

The object of this little book is to describe the various forms of toxins and the physiological and pathological effects which they exercise upon the animal body. The first chapter deals with alkaloidal toxins, ptomaines and leucomaines, the second with toxins and antitoxins, the third with vegetable and animal toxins, the fourth with microbial toxins, and the fifth with venoms. A large number of references to modern literature of this subject are found at the bottom of almost every page. As the book only contains 101 pages it is not of course an exhaustive consideration of this comparatively new but now very large topic.

PHYSICAL CHEMISTRY IN THE SERVICE OF MEDICINE. Being Seven Addresses Delivered by Dr. Wolfgang Pauli. Translated by Dr. Martin H. Fischer. John Wiley & Sons, New York, 1907. Price $1.25.

These addresses were delivered as summaries of Pauli's special investigations concerning the application of physical chemistry to different fields in medicine as rendered possible through advances in the physics and chemistry of organic colloids. The chapters of the book are as follows: On Physico-chemical Methods and Problems in Medicine, the General Physical Chemistry of the Cells and Tissues, the Colloidal States and the Reactions that go on in Living Matter, Studies on Ions, or the Relation of Physico-chemical Properties and Medicinal Effects, Changes Wrought in Pathology through Advances in Physical Chemistry, and lastly on the Electrical Charge of Protein and its Significance.

PATHOLOGY, GENERAL AND SPECIAL. A Manual for Students and Practitioners. By John Stenhouse, M.A., B.Sc., and John Ferguson, M.A., M.D. Lea Brothers & Co., Philadelphia, 1907. Price $1.00.

This is another one of the Epitome Series Quiz-Compends, covering in the neighborhood of 275 pages, prepared as a condensation of pathological facts for the use of students. As a quiz-compend it can be recommended, but like all other books of its class it is too brief to be a book from which a student may adequately study this department of medical science.

REPORT OF THE SURGEON-GENERAL OF THE ARMY FOR THE SECRETARY OF WAR. For the Fiscal Year Ending June 30, 1906. Government Printing Office, Washington.

To those who are interested in military medicine, and indeed in medicine in general, the report of Surgeon-General O'Reilly for the past fiscal year will be of great interest. The difference in the morbidity and mortality rates of the white, colored, and Filipino troops is noteworthy, and the sanitary reports which are made as to the condition of the various posts in this country and in the island possessions are also of value to sanitarians and medical men.

DISEASES OF THE NOSE AND THROAT. By J. Bruce Ferguson, M.D. Lea Brothers & Company, Philadelphia and New York, 1907. Price $1.00.

This little book belongs to Lea's Medical Epitome Series and is designed to present in concise and practical form the diagnosis and treatment of the diseases of the nose and throat, which it does as well as is possible for a duodecimo volume of less

than 250 pages to accomplish. The chapters are some of them followed by a series of questions designed to permit the student to quiz himself upon what he has gone over. We have no doubt that it will aid students to obtain a superficial knowledge of diagnosis and therapeutic procedure, but like most condensed manuals it cannot take the place, except in a very superficial way, of the ordinary text-books upon this subject.

PARAFFIN IN SURGERY. A Critical and Clinical Study. By William H. Luckett, B.S., M.D., and Frank I. Horn, M.D. Illustrated. Surgery Publishing Co., New York, 1907.

This book, dedicated to Dr. Arpad P. Gerster, printed in clear, large type upon paper of high grade and admirably illustrated, gives to the surgeon a detailed knowledge of a method of treatment which he is likely to have regarded with skepticism as to its after-effects because all the reported cases were apparently successful, and the great majority of them appeared in print so shortly after the injection as to suggest that even the operator had some doubt as to his final results. The hundred-odd pages can be covered in an hour's time. The indications for the use of the paraffin injections are both functional and cosmetic. Under the first heading are included intervention in cases of paralysis of the soft palate, of insufficiency of the anal and vesical sphincters, of hernia, of prolapsus uteri, of ankylosis after resection, of varicose veins, etc. Under the second heading are included injections after removal of testicles or mammæ, for the correction of depressed disfiguring cicatrices, for filling up bone scars such as occur after operation for osteomyelitis, perhaps for filling brain defects, and finally injections in cases of saddle-nose deformity, or that resulting from fracture or loss of septum by disease.

After an interesting discussion as to the ultimate disposition of the paraffin, the author holds that its final arrangement—*i.e.*, the permanence of the prosthesis—depends upon the reliability of its anchorage. The softer the paraffin the more likely is it to be absorbed or disappear altogether by oxidation, by phagocytosis, or by some biochemical process not quite understood.

The harder the paraffin the richer in coal elements; hence the more irritating and less absorbable. The harder the paraffin the less the biochemical action, the more stable and lasting the deposit. The harder the paraffin the more rapidly will it cool and solidify in the tissues, thus helping to anchor itself, resisting the action of muscular contractions and outside manipulation, while the capsule is being formed.

The technique and the armamentarium are taken up in detail. Causes of failures and the accidents are taken up. Cases are reported with photographic illustrations of results. The book finally closes with a bibliography.

SURGERY OF GENITO-URINARY ORGANS. By J. W. S. Gouley, M.D. Rebman Co., New York, 1907.

Gouley has compiled an excellent practical book, somewhat informal as to plan, but filled with knowledge gained only from a ripe experience. The first chapter is devoted to Catheters, Bougies, and Sounds. There is included in this brief résumé of the subject an excellent historical sketch. Other chapters in the book are Catheterism and its Accidents, Chronic Urethritis, Bulbo-urethral Adenitis and Orchitis, Retention of Urine during Urethritis; the Prostate, some of its Affections; Urocystitis, its Nature, Causes and Effects; Urocystitis, its Management; Lithotomy, its Early History and Modern Adaptations; Modern Lithotomy and Lithotrity. Other associated topics are discussed.

The author's extensive historical knowledge is well evidenced throughout the entire work. To those who work especially in these subjects and to the general practitioner the book will afford much that is instructive and directly useful in practice.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.A., M.D.

During the past month an interesting discussion took place at the Clinical Society on the so-called congenital hypertrophy of the pylorus. There was little reference to the symptoms, which during the past few years have become well known. The vomiting, constipation, and wasting, associated with marked and visible peristalsis of the stomach and a palpable thickening of the pylorus, form so characteristic a picture in early infancy that once recognized there is little to be added to this description of the disease. The speakers therefore limited themselves almost exclusively to treatment, and the discussion was the more valuable as many who were not members of the society had been specially invited to be present. So keen was the debate that the question of prolongation or adjournment had to be raised, and eventually the meeting was prolonged, but even then many were unable to obtain a hearing. It is to be wished that such a state of things happened more often at the London scientific societies, where formality and politeness are too apt to stifle discussion.

Dr. G. A. Sutherland opened the proceedings with a paper on the medical treatment of this disease, particularly by lavage, associated with careful feeding, and in his opinion breast-feeding, peptonized milk (cow's), or whey were the most suitable foods. He did not believe that drugs were of the least value in this condition. Dr. Voeleker out of seven cases had five deaths, all after operation; the two recoveries were with lavage and careful dieting. Mr. Burghard had operated on 16 cases, of which 10 recovered; the operation done in all was forcible dilatation of the pylorus. Dr. Henry Ashby had come from Manchester by special invitation, and mentioned 11 cases, all of which had proved fatal; only one had been treated by operation. Mr. Dent made a strenuous defense of surgical treatment, but had to admit that about half the cases treated thus died; this he seemed to attribute to the fact that the cases did not reach the surgeon until they were already in a very advanced stage of the disease. Dr. Still's statistics showed recovery in more than half the cases (14 out of 23) under his own observations, and some of these, which were quite as severe as any cases he had seen, recovered under medical treatment alone; 8 were treated by operation (forcible dilatation of pylorus), 6 were treated by lavage and careful dieting (one case by dieting only). Dr. Cautley propounded a class of cases as (1) those with simple spasm of the pylorus with no hypertrophy; (2) those with spasm and slight hypertrophy; (3) those with great hypertrophy. This classification, which was supposed to explain the recovery of some cases without operation, was described by Dr. Hutchinson as a purely theoretical one, resting on no basis of fact. Out of eight cases treated medically under his observation only one had died. Dr. Hutchinson regarded surgical treatment as quite unnecessary in these cases.

This discussion drew forth some actual statistics of the results of treatment in this disease which were badly needed, for hitherto but few have been available for comparison; and it was clearly shown that however necessary operative treatment may be in some cases, it is certainly not necessary or advisable in all. The remarks made were in interesting contrast to those made when the same subject was discussed at the Toronto meeting of the British Medical Association, for the general trend of opinion was evidently much more favorable to medical treatment than formerly.

A meeting of a somewhat different char-

acter took place recently at the offices of one of the daily newspapers. It is not often that members of the medical profession in this country allow themselves to be drawn into newspaper offices—indeed, they are at some pains to avoid the ubiquitous reporter and all his kind; but on this occasion the matter in hand appealed to our profession so strongly that many leading members volunteered to give their support and Sir Thomas Barlow took the chair. The meeting arose out of a series of rather sensational articles written by Mr. G. R. Sims on "The Cry of the Children," in which he drew attention to the presence of little children and even infants with their drunken parents in beer-houses and drinking saloons. Sir Lauder Brunton, Sir Victor Horsley, Prof. Sims Woodhead, and a large number of distinguished physicians and men eminent in all departments of church and state crowded the hall, and spoke strongly in favor of legislation to prevent the taking of children into these scenes of drunkenness and vice. Some difference of opinion arose as to the exact age under which exclusion should be made compulsory; the general feeling seemed to be that no child under sixteen years of age should be admitted to any beer-house, but there was unanimous agreement among all those present—and all shades of political and religious opinion were represented as well as widely divergent views on total abstinence from alcohol—that the presence of little children, and indeed of any child at the school age, in a beer-house or drinking-saloon was an unmixed and dangerous evil, and a committee was appointed, including several of the best known physicians, to bring the matter before Parliament.

At the comitia of the Royal College of Physicians this month the election of president, which is an annual office, took place. The voting resulted, as was expected, in an almost unanimous reëlection of Sir Richard Douglas Powell to the presidency; and indeed any man who has performed the duties of president for one year thoroughly well deserves reëlection if he is willing to accept again the onerous duties which the post involves. He is the chief representative of the medical profession and medical learning in this country, and whenever advice is required on medical matters by the state, whether in royal commissions such as that now sitting on vivisection or on grave matters of state policy in regard to public hygiene, the president of the Royal College of Physicians is the natural person to consult; moreover, he must attend numberless committees and devote no small share of his time to the work of his high office.

A remarkable paper was read before the Royal Medico-Chirurgical Society recently by Dr. Raw, of Liverpool, in which he claimed that a bacteriological distinction was possible between human and bovine tuberculosis, and that certain forms of tuberculosis in man were usually due to the bacillus of the bovine disease, while other forms were due to a different bacillus. Thus tuberculous peritonitis and tuberculous meningitis were produced by the bovine infection, whereas ordinary pulmonary phthisis was due to the bacillus of human tuberculosis. If this should be confirmed by further observation it will be an unexpected corroboration of the famous views expressed a few years ago by Koch.

The death was announced a few days ago of Dr. A. E. Sansom, who was well known in this country as an authority on heart disease. He was for many years one of the physicians of the London Hospital, and also took a great interest in diseases of children. He was one of the earliest supporters of the Society for the Study of Diseases of Children, and I believe took the chair at its first meeting. He retired from practice about two years ago owing to failing health.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., JUNE 15, 1907. | Third Series, Vol. XXIII, No. 6.

ORIGINAL COMMUNICATIONS.

TREATMENT OF BURNS.

BY W. L. ESTES, M.D., A.M.,

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Burns are usually produced by (1) a flame; (2) hot metal (this class includes hot coals); (3) steam; (4) electric flash; (5) chemical burns—escharotics generally (to this class belong *x*-ray burns).

A flame by igniting the clothing produces burns of varying degrees, on account of the variations in temperature at different parts of the flame, and they are usually spread over large areas.

Hot metal conveys intense heat and produces burns of equal degrees on the exposed parts, and they are usually deep burns, implicating circumscribed areas.

Steam produces burns which usually implicate a large area, but on account of its comparatively low temperature these burns are not as deep as those from other sources, unless the victim be exposed to the steam for a considerable length of time. The respiratory tract and the mouth are very apt to be involved from burns of steam.

Electric flashes produce very intense heat, and though the areas affected, as a rule, are not large, the depth of the burn is usually greater than from any other source.

Chemical burns have usually a distinctive effect and malignancy entirely out of proportion to their apparent severity. They seem to have a peculiar inhibitory effect on reparative metabolic processes.

In treating a burn one should always bear in mind its source, since the method of treatment should be varied according to the type and degree of the destruction of tissue. Burns produced by comparatively low temperatures are much more rapid in all reparative processes, and, unless a very large area of skin is involved, they usually heal rapidly, and they are not difficult to treat.

The skin, though taken by surprise in cases of burns, acts as a marvelous resister of heat, and to an astonishing degree protects the deeper parts. In ordinary burns it is rare to find the subcutaneous tissues actually destroyed, though if suppuration occurs they may slough afterward.

Burns must be considered, as regards the general organism, a traumatism of greater or less degree, and locally as a destruction more or less of a very important excretory organ, and the organ which regulates the bodily temperature.

SYSTEMIC TREATMENT.

Systemic treatment is as important as—in some cases more so—local treatment, and usually is the first indication. Every considerable burn is followed immediately by shock. This shock is frequently so intense as to threaten the speedy death of the patient. The variety of shock is commonly psychic. The symptoms are the same as in shock of other varieties; they demand more careful attention because a part at least of the skin will have been destroyed and external applications which in other conditions might be employed cannot be used in burns, and the equalization of the circulation cannot be restored as rapidly, because the capillaries of the destroyed area will remain thrombosed and shut off from the general peripheral work. If the burned area be very large the danger

of the shock will therefore be proportionally great.

The patient will feel cold. If practicable external heat should be applied; in most cases the feet will be available for hot-water bottles, hot bricks, or some other means of heat. If the mucous membranes have not been involved the patient should be given hot drinks by the mouth—*no alcohol,* however. Hot lemonade without sugar is very good, and hot black coffee is efficient. Rectal infusions of hot saline solution, and if a suitable region of loose skin is left uninjured hypodermoclysis of normal salt solution, may be given. In cases of extreme gravity Crile's recommendation of direct transfusion of blood, viz., anastomosing an artery of the donor into a vein of the patient, would serve an excellent purpose. In addition to these measures of restoring heat and circulatory medium, morphine given in a full dose hypodermically is one of the best things, as it serves the double purpose of relaxing vasomotor spasm and it relieves pain and apprehension.

After shock and pain have been relieved as far as practicable, the condition of the heart and respiratory organs, especially in cases of burns of the respiratory tract, should be most carefully investigated. It will be useless and inhumane to attempt any permanent dressing if the patient is too weak to bear it. These dressings are always tedious and require much time to do properly. If the physician therefore loses sight of, or does not recognize, a condition of great weakness in his patient, and in the zeal of the asceptician proceeds at once to do the dressing, the chances are that the patient will be dead before he has finished.

One thing to bear in mind is that burned areas have been made sterile by the heat they have endured. So, unless they have been infected by some application or covering, they require no special disinfection—they need sterile covering, that is all. This suggests, however, a very important point. In transporting burned persons it is of vital importance to remember that burned areas absorb very quickly, especially those produced by flames and steam. Any micro-organisms in a cover thrown over a burned person are very apt to be inoculated into the victim. Thus I have had two or three cases of tetanus occur after burns because horse blankets were used to cover the patient while he was being transported to the hospital. The other systemic effect to be watched for and dreaded in burn cases is an acute nephritis. This is very common in severe burns. Nearly always some bronchitis occurs, and not infrequently hypostatic pneumonia supervenes. Another very grave condition comes on sometimes after healing is well advanced in extensive burns, viz., pulmonary embolus. The onset is very sudden, and the condition of dyspnea and terror is a very distressing one. I have recently had two cases of this complication—one recovered and the other died. Nitroglycerin hypodermically, oxygen by inhalation, and diffusible stimulants seem the best treatment.

These complications must all be treated on general principles. They are always grave indications in cases of severe burns. In my experience duodenal ulcers after burns are very rare. I have seen but two or three cases occur in several hundred burns.

LOCAL TREATMENT.

There is no specific local treatment for burns. Many specific things and many specific methods have been recommended; all these I have tried are not generally adaptable and failed in many cases.

Large burns—that is, burns implicating large areas—are very difficult and trying injuries to dress both for the patient and the surgeon. It is important not to prolong the dressing when the patient is very weak. As I said before, the burned area is usually sterilized by the heat which caused the burn, but the adjoining skin which is not burned has not been sterilized. I think in most instances the surgeon makes the mistake of trying to render the injured area aseptic when he ought to use every practical endeavor to cleanse and sterilize the uninjured skin which adjoins or surrounds the burn. For the pain the first permanent dressing employed should be warm sterile alkaline solutions—such as one-per-cent

solution of bicarbonate of sodium or potassium, or a two-per-cent solution of borax. If these salts are not at hand ordinary chloride of sodium in the usual decinormal strength will do. If soiled coverings have been placed over the burns some attempt must be made to wash off the surface of the burn very gently with an antiseptic solution. A two-per-cent solution of carbolic acid or a one-per-cent suspension of creolin, followed by normal salt solution to remove the carbolic or creolin, may be used.

Large burns should be dressed in sections; the whole surface should not be exposed at once. The clothing, or such shreds as remain, should be cut and carefully removed. Then the burns should be covered with a layer of aseptic gauze wet in a one-per-cent solution of bicarbonate of sodium or one of the other solutions mentioned above. A certain section should be selected, the surrounding skin being carefully washed with soft or fluid soap and sterile water (always scrubbing in a direction away from the burn); then carefully wash off the burn with a mild antiseptic (formalin or bichloride of mercury should not be used, as they are very irritating); then cover with wet gauze, and carefully wash the adjoining skin with a five-per-cent solution of phenol; dry carefully with aseptic pads, then apply the dressings to the burn. Go over the whole area in this way section after section. As to the dressing itself, I think it should be varied according to the individual case. Superficial burns, such as one sees frequently caused by a flame, or by steam, if not extensive do very well with a one-per-cent solution of picric acid dressing—viz., sterile gauze wrung out of a one-per-cent solution of the acid and laid directly over the burn. In case of blisters or large blebs, these should be snipped carefully with a small, sharp-pointed scissors on one side near the base and drained. The epidermis should be carefully preserved at the first dressing. Another dressing which has given me great satisfaction for superficial burns is equal parts of powdered boric acid and subnitrate of bismuth sprinkled over the burn, and laid over this a vaselin plaster made by wringing out gauze from a one-per-cent warm creolin suspension and a thick layer of sterile vaselin spread on it. A thick layer of sterile absorbent cotton should be placed over this, and the whole held in place by a snug but not tight roller bandage. For the deep burns, such as hot metal and electricity produce, I think immediate applications of sterile gutta-percha tissue covered by a thick, moist aseptic dressing is best. Dry dressings are rarely applicable to fresh burns. Also no woolen fabric should be placed directly over a burned surface, for much serum will be exuded; this will dry and cause the cloth to stick to the surface of the burn, with the result that when the dressing is removed much of the epidermis will be taken with it, and great pain will be caused by pulling away the adhesions from the surface of the burn.

Deep burns, those which destroy the whole thickness of the skin at once, are followed in many instances by the formation of a very hard, tough slough, which, on account of the coagulation of all the albuminoids in the area involved, shrinks and pulls on the surrounding skin so that a feeling of extreme tension results; besides, much suffering is produced from the pressure on the underlying nerve filaments. In a short time this charred area sinks below the level of the uninjured skin, and leucocytes soon migrate in increasing numbers and try to rid the skin of the dead part; an area of redness and swelling surrounds the slough, which adds to the pain; and so on. This process may be shortened and the pain relieved by incising the dead area down to the living tissues. In cases in which this dead surface has been as broad as 6 to 15 centimeters I have frequently made multiple short incisions through it. These incisions permit much serum and sometimes lymph and pus to exude, and enable one to disinfect the slough much more thoroughly. These burns soon produce large necrotic areas which cling tenaciously to the tissues below, and which separate very slowly. They always suppurate more or less, frequently profusely, and most disagreeable odors are produced. When the slough is still in place I have found the application

of salicylic acid directly on the slough, gutta-percha tissue over this, and a dry sterile dressing over all, very satisfactory both as an efficient disinfectant and deodorant. For less offensive areas of this kind powdered boric acid applied in the same way is good.

An important point one should always bear in mind is that burned areas, especially larger superficial burns, absorb very rapidly any soluble substances applied upon them. One must be very careful therefore to use no poisonous substance as a dressing, or dusting powder, or direct application. Instances are known in which acetanilide has almost fatally poisoned patients when used as an external dressing on the skin.

No matter how careful one may be in cases of extensive burns, before the sloughs separate there will be some disagreeable odor. Sometimes this odor is very offensive. It has always seemed to me that any organic oil or fat applied to the burns as a dressing, even if sterile when applied, very rapidly becomes infected from the bacteria of the sloughing skin; it decomposes and adds to the fetid odors, and, I think, to the suppuration and sloughing. One cannot safely combine enough of an antiseptic with the oils or fats to prevent decomposition on account of the possible absorption. There are but two substances which seem to obviate to an extent this difficulty, and which make oil a possibility in some cases: these are ichthyol and Peruvian balsam. These may be combined up to five per cent, and be very useful in an antiseptic way and as deodorants. I think, however, it is much better not to use oils or fats, except the inorganic one, vaselin.

On account of the offensive odor burn cases ought to be treated after the open-air method and in apartments isolated from the common surgical wards; and as these odors attract flies in great numbers in the summer-time most sedulous care must be taken to thoroughly screen the patient so that flies may not get on him. I have seen one or two cases of most distressing, repulsive, and serious condition of maggot infection because flies were not kept away from the patient.

After sloughs have separated and granulations are begun, oily dressings, I think, should not be used. Nowadays surgeons rarely treat ulcers by the application of salves. The principles of aseptic surgery should prevail, and the dressings applicable to large ulcers be employed. Skin-grafting furnishes the most rapid and efficient assistance. Reverdin grafts may as a rule be most easily obtained; by those who are not well initiated in the technique of Thiersch's method, these small skin grafts are much more efficiently employed. Many years ago I began to use sponge-grafting (after Hamilton, of Edinburgh, recommended sponge for grafting into bone cavities) for ulcers when I could not get skin grafts. The method I recommended, and still employ, is to use small bits of a thoroughly cleansed and bleached moist sterile sea sponge, applied to the surface of the ulcer with the same precautions and after the same manner that one uses the small skin, or Reverdin, grafts. These act remarkably well as a substitute for skin grafts. Some years ago Dr. Lusk, of Warsaw, N. Y., advocated the use of dried epidermis for grafting. He recommended blistering to raise the epidermis; evacuate the serum, and when the epidermis is dry remove it in small strips and apply to the ulcers. In burns there are nearly always several blistered spots or places where the epidermis exfoliates. At St. Luke's Hospital we have frequently removed these epidermal exfoliations from the patient and applied them as grafts to the ulcerated areas. The epidermal grafts act well if properly managed. For ulcers of moderate size, and for establishing islets and connections in large ulcers, Thiersch's method of using large skin grafts is best, and it promotes much more rapid healing than other methods.

The limits of this paper will not permit me to discuss the indications for treatment in the various regions except in a general way. After the sloughs have separated, and clean ulcers are left, the indication is to hasten healing with the formation of as little fibrous tissue as possible. As I said, grafts will do this, if careful asepsis be

obtained and preserved, and in this stage one usually may preserve asepsis.

Two other extremely important points are to prevent adhesions of adjoining surfaces, and to prevent permanent flexures of the joints. Sedulous care should be used always to interpose separate dressings over two contiguous surfaces—chin and neck, axilla and arms, fingers, folds of the groin and thigh, scrotum and thighs, and about the lips of the vulva, etc.

To prevent synechia when the eyelids and ocular conjunctiva are burned, epidermal grafts are excellent expedients. When the location of a deep burn makes it almost certain to produce ill effects by the contraction of the cicatrix, these regions should especially be grafted, repeatedly if necessary, and sufficiently, if possible, to furnish enough epidermis to cover the dangerous area.

Limbs must be placed in splints or some retentive apparatus used to prevent flexures and fixation in improper positions. Keloid formation after cicatrization requires exsection and grafts or transplantation of skin.

THE TREATMENT OF BURNS.

BY WALTER LATHROP, M.D.,

Superintendent and Surgeon, State Hospital, Hazleton, Pennsylvania.

Among the many cases brought to an institution of this kind there are none that appeal more to the sympathy than those who are injured by fire. For aside from the seriousness of the case, and the early suffering, there is the future thought of possible disfigurement as well as of parts being crippled or rendered entirely useless. In taking up this subject, and contributing my humble portion to this symposium, I am aware that in few instances do the writers on this topic differ more widely; each man of more or less experience has some pet treatment which he thinks is the best, and is sincere in his belief. My earnest wish is that from this series there may be gleaned something of benefit to all who may at any time be called to treat such cases.

I shall not attempt to classify burns, as the text-books do, in regard to the time-honored degrees, but will endeavor to treat the subject in general, mentioning the degree of burn if necessary. In a locality surrounded by mines, railways, and workshops, there occur necessarily numerous accidents, ranging from minor affairs to the most serious; but it is usually from the mines that we receive the cases that are burned. In order to treat the subject intelligently we will place it under four headings:

1. Burns by gas.
2. Burns by steam and water.
3. Burns by powder.
4. Premature blasts.

The most common, as well as the most serious, cases we receive here, with the exception of number 4, are those burned by gas. There are usually two of these at a time, a miner and his laborer; one often burned more than the other, especially if he receives the full force first, by being some few feet ahead. The cause is often due to one or the other entering a supposedly safe chamber, or breast, with a naked light.

The body of gas, which may have gathered rapidly—after being inspected by the fire boss—is instantly ignited, and a fierce blast of lurid flame envelops the unfortunate man or men. The next group are usually firemen, or pumpmen, who are scalded by steam or water from bursting pipes, or blowing out of cylinders or boilers. Burning by powder is often due to carelessness, and in one instance there were eight men brought under my care, the cause being due to one man carrying a keg of powder, not covered, into which a spark from his lamp fell. Two of the men succumbed to their injuries some ten days later.

The last class of cases is a very serious one, owing to the fact that the victim is nearly always badly cut or punctured by pieces of flying débris, and also he frequently requires amputation of a limb, or

portions of one, and often enucleation of one or both eyes. The treatment of this class will be taken up by itself.

In speaking of the methods pursued by myself and assistants, in managing the first three classes, let us imagine that an ambulance has just driven up to the door, bringing a miner who has been burned by gas, steam, or powder. He is carefully carried to the receiving room, for examination and dressing. We still find at times a liberal use of that old favorite, carron oil, which has been applied by his willing and anxious comrades, but which is a nasty preparation, and while no doubt of value is better left unused in this day and generation. The clothing is carefully removed, being *cut off*, not pulled, from the affected parts; any portion sticking fast is let alone for the time being. The skin will be found in a dry and crisp state in most cases where gas or fire is the cause, and if of considerable depth the appearance is a dull gray about the hands, or beefy red where the flesh is deeper. If the patient has been scalded, the skin is usually raised, and peels off in strips, while the under surface is bright-red and moist. If from powder, the surface affected is blistered and black, which changes to the characteristic blue pigment, or "powder marks," when recovery occurs.

The burned surface is covered temporarily, while the uninjured parts are washed. The eyes are first looked after, and frequently show little sign of injury at the time, but in a few hours the lids are greatly swollen, as is also the entire face. After being washed, the injured parts are dressed (loose skin being removed) by picric acid gauze; this is used in nearly all cases, being applied over the entire burned surface, covered with plain gauze, frequently cotton, and a roller bandage applied to limbs, and a many-tailed one about the abdomen and chest. A mask is placed over the face, with openings for the mouth, etc. Cold compresses are used over the eyes with great benefit. When picric acid *solution* is used, we prefer lint to gauze, and apply in the same manner. The acid dressing is used for several days, or if the burn is not deep, is applied until the case is healed.

In cases of deep burns, in which more or less sloughing will occur, the dressing after four or five days is changed to petrolatum, spread on lint, with a small quantity of iodoform or acetanilide dusted over it, but not enough to produce dangerous symptoms from absorption. At each dressing the burned surfaces are washed with 1:20 carbolic solution, often preceded by spraying with peroxide of hydrogen from an atomizer. Any dead tissue is carefully cut away, and then the dressings applied. During the suppurating stages burns are dressed daily until healthy granulations appear, after which only sterile dressings are used. In obstinate cases, or slow healing ones, my favorite dressing is composed of ichthyol, balsam of Peru, and vaselin, spread on lint, and frequently when this fails I have seen remarkable results from the application of the old-time resin cerate, and to show our faith in it as a stimulant to any indolent surface I might add that we use about one hundred pounds each year.

The results, as shown in more than five hundred cases, have been most excellent; in the majority of cases there has been little or no disfiguring and very little impairment of function. I refer of course to the cases in which the burns were of the first and second degree.

The *fingers* should always be *carefully dressed by having gauze between each, that no webbing may occur.* Splints should be used where the tendency to contraction is shown in arm or leg.

Shock is always present to a greater or less extent in these cases during the first twenty-four hours, and is treated by the use of morphine and atropine as well as strychnine hypodermically.

The preparation of ergot known as "ergone" is one of the best means I know of in these cases, *or any case of shock,* and is of distinct benefit. We give it hypodermically every hour, for four hours, 25 minims at each injection. The thirst which is so often distressing can be greatly relieved by enemas of salt solution, three drachms to the pint of water. *Whisky is contraindicated,* and if given will nearly always produce vomiting. Hot water or

clear coffee is a better stimulant, if any is desired. The kidneys need attention, as in serious burns about the back and abdomen suppression may occur and uremic symptoms soon develop. I am in the habit of giving as routine treatment an effervescent salt of lithia combined with bicarbonate of soda, potash, and caffeine, with plenty of water.

Cases of the fourth division usually present a most striking appearance and are generally due to a premature blast. They are fully as common as the ordinary cases of burns, and are frequently very serious and more disfiguring.

We also have many cases due to the explosion of the famous dualin cap (which is used to set off the blast). These copper caps, small and innocent in appearance, are often found by children and exploded by them, with the loss of one or more fingers and sometimes the whole hand. In the case of the premature blast the miner standing in the circle of diminished atmospheric pressure is not only burned by the flash from the powder, and often terribly lacerated by flying débris, but frequently has hands or limbs, or both, torn to shreds.

On admission to the hospital these cases are treated first for the hemorrhage and shock which are always present, and when possible the uninjured parts are thoroughly cleansed. The patient is then anesthetized, and coal or other foreign matter extracted from his body, but it is impossible to remove all, and subsequently small pieces are thrown off by nature, through suppuration. Amputation is done where necessary. The eyes are usually filled with fine dirt and minute particles of coal. These particles are removed as completely as possible, and boric wash used, followed by iodoform, and both eyes bandaged for several days, dressing each day if needed.

Where the eye is destroyed, which is not uncommon, enucleation is at once performed; where serious corneal trouble develops, or any dangerous eye symptoms, we endeavor to have the case transferred to the Wills Eye Hospital, if he can be moved.

The treatment of the body, or injured parts, consists of sterile dressings, renewed daily for the first week, then followed by the special ointment mentioned, vaselin and iodoform, or stearate of zinc with acetanilide.

Picric acid is not used in these cases, but carbolic acid, 1:20 solution, is exceedingly valuable, and at each dressing is applied thoroughly over the entire injured surface; where there are several deep holes we keep them drained by gauze packing moistened with carbolic solution 1:20. We often reverse the first treatment and use the vaselin dressing first, followed by dry dressings. The results are good in either method, surgically, while the cosmetic effect is always the same, the patient being marked for life by the characteristic coal or powder stains. I have had no experience with the immersion or bath treatment of burns, and while it may be good I am content to get the excellent results already gained by the methods mentioned.

To summarize: For burns of moderate severity from gas, water, or powder, *picric acid comes first of all.* It is wonderfully soothing in effect and promotes rapid granulation and healing.

For deep burns, picric acid for five days or a week, followed by vaselin on lint, with iodoform, or acetanilide (this last is *very valuable,* but *requires watching where a large surface is involved*). The burned area is cleansed daily with *carbolic solution* before reapplying dressings. When the surface is dry or free from irritating discharges, compound stearate of zinc with acetanilide is most valuable.

Indolent and non-healing surfaces are best treated by resin cerate, and to me it is one of the most helpful preparations we have. Skin-grafting is the rarest of operations here, and *resin cerate gets all the credit.*

For explosion or blast cases the treatment is as mentioned under the fourth division.

The systemic treatment, as mentioned, is almost routine, as regards ergone, quinine, and especially the preparation of lithia containing sodium and potassium bicarbonate with caffeine. The results are excellent both as to recovery and cosmetically, except in class four.

THE TREATMENT OF BURNS.

BY ALLAN W. URMSON, M.D.,

Surgeon to the Newcastle Works and Furnaces of the Carnegie Steel Company, Newcastle, Pa.

It is often a difficult problem to know which is the best local treatment to use in burn cases. Whatever treatment is adopted, the aim should be to limit the resulting inflammation, prevent infection, assist the normal elimination of the eschar, develop healthy granulations, and limit the deformity.

Burns of the first degree seldom require any treatment. In slight or moderate burns I apply strips of sterilized gauze, saturated with a nine-tenths of one-per-cent watery solution of picric acid; over this I place a thin layer of absorbent cotton, and secure the whole dressing by a gauze bandage. I allow this to remain on the part for two days. A second dressing is never necessary.

In second-degree burns, those in which the inflammation of the skin results in the formation of vesicles or bullæ, I apply the same solution, after carefully removing the clothing from the injured part. Blisters are evacuated through punctures, care being taken not to disturb the elevated epidermis, and the burned surface cleansed as thoroughly as possible. Strips of sterilized gauze are then saturated with the picric acid solution and applied in the same manner as in burns of the first degree. This is left on the part for two days, when the dressing is thoroughly moistened with the same solution to soften it, and removed. A second dressing is applied in the same manner and allowed to remain on the part for two or three days. This is usually all the dressing necessary.

The picric acid solution allays pain, limits the tendency to suppuration, and leaves a smooth, supple cicatrix. There is some objection to the use of this solution, owing to the yellow stain it leaves. It is my custom immediately after dressing a case with it to wash my hands in alcohol, which readily removes the stain.

In burns of the third degree I am more cautious in the use of the picric acid solution, for fear of poisoning the patient, although I have never met with any ill effects from its use. I allow the dressing to remain on the part for twenty-four hours, after moistening the gauze; I then remove it and dress the burned surface with some sterile powder, usually aristol, maintaining as dry a wound as possible. I dress these cases every day. Should suppuration occur, I use a spray of hydrogen peroxide, irrigate the wound with normal salt solution, remove as much of the slough as possible, dust powder over the surface, and apply sterile gauze and fix by gauze bandage.

In burns in which there is deep sloughing and great destruction of tissue I employ the immersion bath of 1:12,000 solution of bichloride of mercury, maintaining the temperature at 37° to 38° C. The influence of this bath on the wound is most favorable. There is a ready escape of the discharge, reduction in temperature, and the freely granulating surface is apt to be covered more readily with skin.

Large granulating surfaces are covered with skin by the transplantation of Thiersch skin grafts.

Much has been claimed for the open method of treating burns. Experience has convinced me that while it acts nicely in first- and second-degree burns, treated in hospitals, in most cases it is unsatisfactory when carried out at the patient's home. In cases I am able to send to the hospital, I apply the picric acid solution for twelve hours, then remove all dressings, place the patient in a sterile bed, make a tent of the upper bedclothing, give morphine to relieve pain, and allow nature to form crusts, which render the field unfertile to all microorganisms by depriving them of the moisture necessary for their development. In cases in which there is much moisture I

find it necessary to dust some sterile powder over the burned surface.

The scar under this treatment is smoother, smaller, more flexible and movable than under the occlusive dressings.

I have abandoned the use of carron oil, owing to the great amount of sloughing which invariably follows its use.

Of course in all cases I give stimulants when indicated, use opiates for relief of pain, and regulate the functions of the body.

TREATMENT OF BURNS AT SHELTERING ARMS HOSPITAL, HANSFORD, W. VA.

BY JOHN EGERTON CANNADAY, M.D.,
Surgeon-in-charge.

We receive a large number of burned patients each year. These burns are produced by a number of different causes, among which are premature explosions of powder and dynamite, contact with live wires, steam, and hot water. Serious burns also result from contact with coke ovens, boilers, or other heated objects when the victim is stupefied by alcohol.

When these cases enter the hospital, shock if present is treated by the application of artificial heat and by the administration of normal saline solution by rectum or subcutaneously. The soiled clothing worn at the time of the burn is removed and the patient is given a warm sponge bath. If necessary opiates are given to relieve pain. As much of the necrotic tissue as possible is removed with scissors and tissue forceps. The burned area is cleansed as thoroughly as possible by the free use of normal saline solution. Sterilized petrolatum is liberally applied, and a light gauze dressing is bandaged over this. This dressing is changed daily or oftener. Each time the wound is cleansed as thoroughly as possible, scabs and bits of necrotic tissue being removed. By keeping the surface as clean as possible the absorption of septic material will be kept at a minimum. The sterile petrolatum protects the freshly burned and sensitive surface from the air, prevents the gauze from sticking to the granulations, is inoffensive in odor and appearance, and is inexpensive. If the burned area is large, there is danger from absorption in using the stronger antiseptics in ointments or compresses. Boric acid and several other of the so-called mild antiseptics are powerless to prevent germ growth, hence I do not depend on them. Frequent care and careful dressings will in a large measure prevent the offensive odor that sometimes is so apparent in these burned cases. If pus appears it is removed by thorough irrigation, and the part affected is lightly touched with a weak solution of iodine.

As it is not always possible in the beginning to tell whether or not the entire thickness of the skin has been destroyed, I usually wait about three weeks before considering skin-grafting. By that time the skin left will have had ample opportunity to show its powers of regeneration. Preparatory to this step the granulations must be smooth, firm, and in a healthy condition. In attaining this condition it may be sometimes necessary to lightly touch especially exuberant granulations with the thermocautery. A bidaily dressing of gauze wet with chloral hydrate solution (2 grains to the ounce of water) and covered with oiled silk will often secure a healthy granular surface.

In the operation of skin-grafting a modified Thiersch method is usually followed.

During the early stages the patient is kept quietly in bed on a liquid diet. The bowels are kept open by salines, and the patient is encouraged to drink water rather freely. During the later stages some of the preparations of iron are used. In accordance with Sneve's suggestion certain cases of superficial burns are treated by exposure to the air after being cleansed and dusted with some inert sterile powder. The desiccating influence of the atmosphere early dries a leaky surface and healing takes place rapidly.

THE TREATMENT OF BURNS IN THE STATE HOSPITAL FOR INJURED, FOUNTAIN SPRINGS, PA.

BY J. C. BIDDLE, M.D.,
Surgeon-in-chief.

As you have asked simply for the treatment of burns in this hospital I will give it to you in as few words as possible. I will not even attempt any classification or description of the symptoms. The symptoms vary much, according to the part of the body involved in the burned area, the temperament of the patient, and the particular degree of the burn.

The wound is as a rule of such a very painful nature that extensive or thorough washing for the purpose of sterilization is simply out of the question. In an extensive burn, or in any case in which there is great shock, washing must of necessity be dispensed with. To make a surgically clean wound in a burn where the epidermis has been destroyed is in my judgment impossible; of course the heat will have destroyed all the germs on or in the skin at the time, so that only those coming in contact with the surface afterward need be destroyed or removed.

In the treatment of more than three thousand cases of burns I have tried all the treatments suggested from time immemorial, including picric acid. My own treatment which I have been using for twenty-three years is composed of carbonate of lead 1 pound, powdered acacia 6 ounces, bicarbonate of soda 3 drachms, and a sufficient quantity of linseed oil to make a thick, creamy paste. This is spread upon lint or Canton flannel, then cut into strips and applied to the burnt surface, after all the blisters have been cut open with a pair of curved scissors, all the shreds of cuticle removed, and washed with soap and water as thoroughly as the case will permit. Care should be taken to apply the dressing neatly and not too tight. The fingers or toes should be well separated and all joints extended. The first dressing is permitted to remain until the secretions have saturated the dressings, when they should be changed. Frequent dressing is meddlesome surgery. After suppuration occurs (and this will occur in all cases in which the tissues have been destroyed) more frequent dressing will be necessary.

I have tried picric acid on cases in which I had every reason to believe that the burns were of the same degree, the patients being side by side during an explosion of gas in the mines, and I am satisfied that there is more scar tissue following the use of picric acid than after the use of my own treatment. I am unable to explain the reason, but the facts are indisputable. Whether it is the incorporation of the acacia with the lead I am not prepared to say, but in my experiments I was looking for something to exclude the air. I do know that this treatment will relieve the inflammatory condition and prevent or modify the shock. This treatment is continued until the surface is covered by granulations, when a petrolatum dressing or powdered stearate of zinc is applied. If the surface is very extensive skin-grafting is resorted to at once, using the small grafts.

I have not had a case of lead poisoning for fifteen years following the use of this dressing, and here again I must attribute the reason to the acacia. In using the lead dressing without the acacia the symptoms of lead poisoning and lead colic will soon develop, especially in an extensive burn after the charred tissue has sloughed away.

The shock, which is usually severe after an extensive burn, or in a highly nervous person, is treated by the use of strychnine in 1/20- or 1/30-grain doses, hypodermically, every two or three hours; digitalis; and aromatic spirits of ammonium. Twelve to fifteen ounces of normal saline solution is given by hypodermoclysis every six to eight hours. Morphine sulphate in ¼-grain doses, repeated frequently, is used to relieve the pain and restlessness.

THE TREATMENT OF BURNS AND SCALDS EMPLOYED IN THE POTTSVILLE HOSPITAL.

BY J. HARRY SWAVING, M.D.,
Surgeon to the Miners' Hospital, Pottsville, Pa.

There are probably few conditions which the physician or surgeon is called upon to treat which require a more earnest effort on his part to relieve the intense suffering than do the cases of burns which we so often see in the various institutions throughout the coal regions. Hardly a day passes but one or more of these cases are brought to our institution, and it is a common occurrence to see one whole side of a ward filled with these poor fellows: burned either by steam, hot water, or from an explosion of mine gas, in which case they come in actual contact with the flames.

For the relief of these conditions there are many and various ways, and if you resort to your library, select a volume, turn to the subject and read, you will find a well-defined classification, namely, burns of the first, second, and third degree, together with a host of remedies with which to treat this condition.

These three classifications denote the severity or depth of the lesion, but do not signify the amount of area involved. It is not my intention, however, to speak at any length of these different degrees, nor to mention the symptoms, pathological conditions, or sequelæ, but simply to give you an outline of the local measures which best combat the pain and suffering which this class of patients experience.

No matter how severe the burns, the local treatment is precisely the same in all cases, and in brief is as follows:

The patient upon entrance to the hospital is placed in the accident ward, the temperature, pulse, and respiration ascertained, giving us the degree of shock, a condition which all of these cases experience to a greater or less degree. If the condition is found to be critical, the local treatment is now a secondary matter, all attention being paid to the patient's general condition, but just as soon as an improvement is noted local treatment is begun as follows:

Exposing only a portion of the body at one time, as a leg, arm, etc., the part is carefully washed with a warm solution of boracic acid, salt solution, or sterile water. I prefer the sterile water with tincture of green soap. By this most of the dirt can be removed, allowing you to inspect more carefully the field of operation.

The larger vesicles are incised, removing the tension, all destroyed or charred tissue is cut away, but I do not deem it wise to expose the healthy raw surface, as the pain seems to be more acute if this is done; the smaller vesicles are not disturbed.

The time consumed in caring for these smaller vesicles only adds to the discomfort of the patient, and I believe that the matter of exposure in these cases is of vital importance.

In most cases it seems necessary to again wash the part, and if done a second time I prefer warm sterile water, after which the patient is ready for the dressing.

After a number of years of experience, in which time I have had under my care several hundred of these cases, and during that time having used almost as many different preparations, I have found none so efficient, both for the comfort of the patient as well as for the convenience of the physician, as the picric acid dressing.

Having in hand a sufficient number of strips of sterile gauze about ten inches wide and of a convenient length, these are immersed in a saturated solution of picric acid, wrung out to the extent that no dripping occurs, and the part just cleansed is bandaged with from three to five layers of this gauze, according to the depth of the burn, and this in turn is covered with a goodly supply of cotton and the whole secured quite firmly with a roller bandage.

The above treatment has in my experience given by far the best results, and I would recommend it for the following reasons: The short space of time consumed in the dressing; the cleanliness of the dressing itself, enabling us to discard

those preparations of oil which are so objectionable for many reasons. The rapidity with which the pain is relieved by this method is certainly far greater to my mind than any other that I have used, and in large institutions, where expense is an item, there is in the course of a year a big saving over the preparations heralded by the different drug houses.

This first dressing is allowed to remain for from two to five days, according to the amount of sloughing and the general condition of the patient, when it is removed and another one put on, this being continued until all sloughing has ceased, when the treatment is changed to some ointment which the physician may choose. For this I usually prescribe the following:

Zinc ointment,
Bismuth formic iodide ointment,
Petrolatum, equal parts.

The matter of a healing ointment is not of so much importance, and many other combinations may be equally as good.

In the general treatment, to combat shock, stimulants such as ammonia, strychnine, and alcohol, with warm coverings, hot bottles, etc., should be used. Morphine must be used cautiously, and later fluid nourishment, with regulation of the bowels, cutaneous and renal secretions. Iron, quinine, and treatment calculated to support the system under the drain of prolonged suppuration are useful.

Where destruction of tissue has occurred to a marked degree, splints, traction, and position must be employed to prevent or overcome cicatricial contractions, while early attention must be paid to the condition of the granulations, with free skin-grafting, the method employed being a matter of choice.

In a recent tour of the hospitals abroad I was greatly interested in their manner of treating these burn cases, and I found one method which I thought very unique, and where circumstances permit would, I believe, give even better results than any method now in vogue in this country. It consists in immersing the patient in a tub of water, remaining there until all sloughing has ceased. The water is changed from day to day, or oftener if required, and every day the patient is taken out and the sloughing tissue removed. By this method the patient's suffering is reduced to a minimum, and the ward is rid of that odor so objectionable wherever you find these cases. I believe this to be an improvement over any method I have seen, and one well worth trying.

THE AURAL AND LARYNGEAL COMPLICATIONS OF TYPHOID FEVER.[1]

BY LEWIS S. SOMERS, M.D., PHILADELPHIA, PA.

While the upper respiratory tract, including the ear, is involved in a considerable number of typhoid patients, the majority of such affections are of trivial moment and are amenable to purely medical treatment, as even ulcerations of the mucosa heal with but little difficulty and aural complications usually terminate in resolution without seriously damaging the hearing, or endangering life. It is not, however, these cases that it is desired to consider here, but that smaller number in which the aural, or laryngeal, lesion requires surgical treatment, and often presents a serious and not infrequently fatal issue, either during the course of typhoid fever or during convalescence. As these complications necessitating surgical treatment occur in the ear and larynx, it is these two organs alone that it is desired to consider here, and no mention will therefore be made of the non-surgical complications, or of the changes so frequently found in the pharynx and nasal chambers.

Considering the larynx first, for here the lesions may seriously endanger life, it will be found in the majority of typhoid patients presenting laryngeal complications that ulceration when present is superficial, more or less limited in area, and heals without further annoyance. The frequency with

[1]Read before the North Branch of the Philadelphia County Medical Society, Feb. 19, 1907.

which ulceration occurs varies from 1.5 to 29 per cent, depending on the virulency of the particular epidemic; Kanthack in 61 autopsies finding this condition in 26 per cent. This includes, however, all forms of ulceration, but while the superficial ulcers are frequent, the deep variety leading to serious cartilage changes is more rare, although if careful examination would be made of all patients without waiting for laryngeal symptoms to develop, the frequency of such complications would undoubtedly be more fully appreciated.

Ulceration mostly takes place at the height of the febrile disorder, or in the later stages, at a time when the intestinal ulcers are undergoing exfoliation and cicatrization, while edema as a primary symptom, which is almost invariably fatal, may occur as early as the second week, or not until convalescence is progressing. These lesions are at first characterized by infiltration, and then by breaking down of the inflammatory tissue and ulceration; the ulcers being most frequently found on the under surface of the epiglottis, the inner surface of the arytenoid eminences, and on the ventricular bands, while of the cartilages the cricoid is most frequently involved, the thyroid cartilage rarely being affected by necrosis.

Even the serious destructive lesions are usually preceded by the superficial erosion which may rapidly penetrate the deeper structures, and involving the perichondrium cause extensive destruction of the cartilage. Especially does this perichondritis involve the cricoid and arytenoid cartilages, the former being destroyed in great part by the purulent process, while the latter may be exfoliated in their entirety. The ulcer on the posterior internal wall of the larynx is deep and is often accompanied with extensive edema of the surrounding structures, or of the entire laryngeal interior, so that a most serious complication develops. The epiglottis is less frequently affected, as extensive destruction is rare, although small portions may be destroyed, or as much as half of it may become necrosed.

The cause of the serious ulcerative and necrotic lesions in the larynx is generally the result of secondary infection by pus cocci, the typhoid fever predisposing to lymphoid destruction and the laryngeal mucosa being readily susceptible to injurious influences, so that a portal of entry is developed for the entrance of the various pus organisms, although in some cases the infection is undoubtedly due to the specific bacillus of the disease. The necrotic ulcers seem to be analogous to the intestinal lymphoid lesions, and this similarity is further enhanced by the primary laryngeal lesions being located in areas where aggregations of lymphoid follicles are gathered, such as the posterior wall, the attachment of the vocal bands at the arytenoid cartilages, and at various sites on the epiglottis, all these sites corresponding to the ulcerated areas. One cartilage may be independently affected, such as the cricoid, or several may be involved at the same time, depending on the extent of the primary ulceration and the subsequent perichondritis, as in the majority of cases the destruction of cartilage is secondary to the ulceration of the mucosa; but in rare instances perichondritis with the formation of an abscess may develop without ulceration, analogous to that occurring in the ribs, and in such cases the typhoid bacillus undoubtedly plays the important rôle.

It must also be remembered that serious complications may take place as the result of changes in adjacent organs, dyspnea from stenosis and edema of the larynx under such circumstances being dependent upon pressure symptoms arising from acute inflammation, or abscess formation in the thyroid gland. It is not infrequently characteristic of these complications that serious destructive changes may be taking place, while the subjective symptoms are of apparently little moment, and especially is this the case in individuals who are in a semistuporous condition. Later on local pain may be complained of; if there is much swelling of the posterior wall there will be difficulty in swallowing, with, at times, aspiration of food into the larynx; cough will occur, especially when the patient attempts to speak, and hoarseness or complete loss of voice may be prominent.

At times symptoms of acute edema will develop so suddenly and without warning that fatal dyspnea may ensue before proper treatment can be obtained, so that in cases showing laryngeal involvement of any grade careful watch should be maintained, especially if the patient is at all stuporous, while should increased respiration with cyanosis and dyspnea be observed, the larynx should always be examined for these complications. Usually the laryngeal changes remain localized in this organ, but in rare instances purulent inflammation may spread to the mediastinum with pus infiltration and the development of emphysema, or as the result of extensive perichondritis the tissues of the neck may become involved in secondary suppuration and gangrene. Of those who recover from these serious lesions, a certain number will suffer from cicatricial stenosis of the larynx with the development of adhesions, or serious defects necessitating the wearing of a tube for a time at least, and in severe cicatricial deformities a permanent cannula may be necessary.

When perichondritis of the larynx develops during typhoid fever and becomes established, it is impossible to arrest it, and the surgeon must be prepared to do a tracheotomy should the breathing be seriously interfered with, while when pus has formed, it should be evacuated after a preliminary tracheotomy, unless the pus can be reached through an external incision, when this is not necessary. If edema is localized and not of a severe type, scarification of the affected areas will usually produce relief, but when it represents one of the symptoms of the underlying perichondritis and necrosis of cartilage, tracheotomy will be necessary, although the dangers will not then be entirely eliminated, as pus formation and exfoliation of cartilage will still demand constant care; while as long as the cartilage remains necrotic and the perichondritis is in an active state, it will be necessary for the patient to wear a cannula, and this will have to be retained until all active changes in the larynx have ceased and a free breathway is assured.

As the middle ear with its adnexa constitutes an essential portion of the upper respiratory tract, so far as continuity of structure is concerned, it is evident that this portion of the auditory apparatus would be frequently involved during the course of typhoid fever, and while serious changes in the ear are less common than in other infectious diseases, yet it is the organ of special sense most frequently involved in this affection. Clinically, in two to four per cent of cases, the ear is involved to a sufficient degree to call for more or less active treatment, but undoubtedly a larger number of patients present aural changes of various kinds that are not discovered, or are of such minor grades of inflammation that no attention is called to them.

As a rule the ear complications are the result of an extension of inflammation through the Eustachian tube from the nasopharynx, and this may resolve itself into simple congestion, catarrhal exudation without perforation of the membrana tympani, or into purulent otitis media with or without involvement of the mastoid process and its various complications, such as sinus thrombosis, periostitis, and caries of the petrous bone, facial paralysis, or the cranial contents may be involved. In patients with marked stupor it is advisable for these reasons to carefully examine the ears at frequent intervals, in order that such complications be recognized early, and especially is this the case when the condition of the patient is such that he is not liable to complain on account of his profound stupor, such as is seen in severe types of typhoid. When purulent otitis continues during convalescence, secondary meningeal or sinus complications may develop at this late period, and the presence of headache during convalescence, especially in an individual who has not been subject to this affection previously, should cause renewed investigation of the aural suppuration, as such a symptom may be strongly suggestive of some intracranial mischief.

As far as the external ear and auditory canal are concerned, it is rare that pathological changes take place here as the result of the systemic disease; furunculosis may occur either independently or as part of a

general dermal infection, especially during convalescence. More serious is the periostitis of the external canal caused by the extension of inflammation from an abscess of the parotid gland, with the escape of pus through the cartilaginous canal.

Much more frequent and important are the inflammations of the middle ear, and of these tympanic suppuration only will be considered here as presenting a purely surgical complication. This usually develops during the fourth or fifth week of the typhoid fever, and if the pus is not evacuated early a large perforation usually forms in the posterior segment of the tympanic membrane, preceded by severe pain and tinnitus. Generally the suppuration is of longer duration than that due to other causes, and the hearing seems to be more profoundly impaired as the result of accompanying internal ear changes, but at the same time the tendency toward repair and cessation of the suppuration is better than that occurring in the course of other infectious diseases, and cicatrization of the perforation usually takes place with restoration to normal of all, or a greater part, of the auditory acuity.

A characteristic of suppurative otitis during typhoid fever is the tendency to the early development of mastoid abscess; the inflammation may at times involve the mastoid process simultaneously with the middle-ear suppuration, and while the symptoms are the same as in mastoiditis from other causes, yet marked tenderness to pressure over the mastoid process is an early sign which is usually out of proportion to the objective changes in the middle ear. Not only may the disease of the bone accompany the middle-ear suppuration, but in some cases it may even precede it, resembling in many respects an acute osteomyelitis, which would seem to indicate its relation to the general disease as a direct complication. In such cases the temporal bone may be extensively involved and large sequestra form, unless the condition is recognized early and promptly relieved by operation.

The treatment of these aural conditions complicating typhoid fever does not differ in any way from that due to other causes, but it is essential that pus be evacuated early, and especially is this so when there are indications of fluid confined in the middle ear. Early and free paracentesis of the membrana tympani with ample drainage will prevent in many cases the development of serious mastoid involvement, and when the latter is the seat of pathologic change one should not delay opening it and removing all the diseased tissues until serious symptoms develop, as extensive osseous destruction may be taking place with but minor subjective symptoms, but early and radical operative measures are indicated as soon as the diagnosis has been made.

THE SUCCESSFUL TREATMENT OF PULMONARY PHTHISIS IN GENERAL PRACTICE.

BY KARL VON RUCK, M.D., ASHEVILLE, N. C.

In almost every communication on the treatment of pulmonary tuberculosis in which the curability of the disease is dwelt upon, the fact is set forth that an early diagnosis is the first condition and that this must be made by physicians in general practice, who, as a rule, are consulted at a time when the symptoms are not yet developed to a degree that the affection is of easy recognition; and therefore when the disease is in the early curable stage.

In published papers on the diagnosis of the early stages the same facts are insisted upon, and every sign and symptom has been described and analyzed for the general practitioner's benefit so often, and with such uniformity, that there is little to be added, and the general practitioner, if he has read and studied one in a hundred of these appeals for his coöperation, must be presumed to know all about the importance and the mode of examination which are to preserve him from error in dealing with the class of cases under consideration.

Those of us who are specially interested in and devote ourselves to the treatment of the disease naturally recur to the cause which so often stands in the way of good and permanent results—*i.e.*, the serious advanced stages of cases coming under our care; my own admissions show only about 18 per cent of early-stage cases. We naturally want the patients sent to us when we have the best opportunity to afford them lasting benefit, be that from treatment upon one plan or another in private practice or in institutions especially equipped for this purpose.

While this is all natural, we should not forget that the number of patients able to take full advantage of the early diagnosis, even when made in a curable period of their illness, is relatively very small. The great majority of patients are for one reason or another obliged to remain at home and do the best they can there, often without being in a position to give up their environment, or their occupation, that presumably has had a part in the development of the disease or in the outbreak of subjective symptoms, until obliged to do so by physical inability to continue.

These patients remain under the care of their family physicians, who must improvise and follow the best methods they can, and these consist at the present time in as good feeding as the patients' circumstances afford, in securing as much life in the open air as possible, and in treatment of symptoms as they arise. Under such a course the symptoms may ameliorate or disappear for a time, but permanent relief, or even latency for a number of years, is not frequent.

The obstinacy of the disease, its progression, or the recurrence of active symptoms frequently leads later to sacrifices by family and friends, as a rule now, to save a life evidently jeopardized. Such sacrifices when determined upon must still be of the least possible degree, since many times they imply borrowing of money, the sale or mortgaging of a home, or expenditure of the accumulated savings of parents or other members of the family or the contribution of their earnings, that the one sick may have improved advantages of climate or of the services of a specialist, or both.

Climate is the usual object of the sacrifices spoken of, and though often inadequate a certain degree of benefit is so commonly observed in the beginning of the disease that both the laity and the profession consider it most important. For more than this advantage the means at hand are often insufficient, and professional care is presumed not necessary unless when reverses and complications occur.

It is at such junctures that the specialist sees this class of patients and often finds the case incurable, and it is natural that cumulative experiences of this kind incline him to write and publish another appeal to the general practitioner to make an early diagnosis and send his patients in a curable stage.

This state of affairs must continue until the general practitioner can himself successfully treat his patients. His early diagnosis, although made much more frequently than commonly supposed, avails but little from a therapeutic point of view, so long as there is not also an early successful treatment in his hands that can go with it for this class of "home cases," which constitute perhaps 80 per cent or more of the morbidity of phthisis.

The hope that specific remedies might be used by the profession at large was quickly suppressed when Koch first introduced tuberculin, owing to its use in unsuitable cases and in doses that too frequently proved excessive and injurious. Its danger of severe reactions and unavoidable accidents, of which there was made so much in the beginning, have prevented its general application even by specialists and institutions until more recently, when exact methods and more reliable preparations have tended to reëstablish its value, and have led to a more extensive and also to a more conservative use. That a limited amount of danger can nevertheless still be shown even in the most careful and best trained hands is however true, and that such a danger would be realized more often in cases that have to be treated in general

practice without the necessary supervision and control is highly probable.

In my own study of the subject I have earnestly endeavored to find a preparation to which no such danger attaches, and which should give satisfactory results in the hands of the general practitioner as well as in my own.

In my own use of specific remedies I have, the same as others, endeavored to find a preparation which should be free from all danger, even in the hands of the general practitioner, and which should possess more marked therapeutic efficiency. My use of antiphthisin, tuberculocidin, purified tuberculin, and of other modifications prior to 1897, proved on the whole more satisfactory as concerns safety, but in clinical value they were apparently not materially superior to the old tuberculin.

Upon the consideration that the object of the specific treatment was to increase the specific resistance of the organism against the bacillus, and that for this purpose the bacillary substance itself was essential, the latter has been employed by me since, in the form of a watery extract which contains the soluble proteins of tubercle bacilli. To my experience in regard to safety and efficiency of this preparation, I have frequently referred in the reports from the Winyah Sanitarium; and to the one published in 1901 I appended the results of an inquiry concerning its safety and value in the hands of others, who had treated a considerable number of cases.

Another such inquiry has been made during the last six months, the results of which are considered fully in a pamphlet now in course of printing entitled, "A Clinical Study of 293 Cases of Pulmonary Tuberculosis Treated in the Winyah Sanitarium from January 1, 1905, to December, 1906, with a Consideration of the Value of Specific Medication."

In the general part of this study are included 1166 cases treated in the Winyah Sanitarium since 1897, together with 2183 cases reported to me, all of which have been treated with the *watery extract of tubercle bacilli,* in connection with the usual methods —making a total of 3349 cases. Of the 2183 cases treated by others, 921 were treated in institutions, and these together with my own material of 1166 cases show that institutions obtained on the whole better results than were obtained in private practice, which we would naturally expect. Thus of 2087 cases treated in institutions there have apparently recovered 56.1 per cent, while failures to obtain improvement are recorded in 15.7 per cent. Of 1262 cases treated in private practice there have apparently recovered 44.3 per cent, and failures are recorded in 18.8 per cent.

The stages of the disease were nearly uniformly distributed in institutions, the early-stage cases amounting to 24 per cent of all cases treated. In private practice the early-stage cases constitute about 33.3 per cent, which difference is not to be lost sight of in comparing the results from institutions with those of general practice.

Among the physicians who reported their results to me were sixty-eight who treated their cases at home in localities having no special climatic advantages. Their material comprised a class of patients who for one reason or other could not or did not leave their places of residence, and as a rule remained under the care of the family physicians. It is their experience that particularly interests the latter, and as we shall see their reported results are full of encouragement. They treated altogether 423 cases of pulmonary phthisis, of which 153, or 37.5 per cent, were stated to have been in the first stage, 124 in the second, and 146 in the far-advanced stages of the disease.

Their reported results by stages are as follows:

Early stage, 153 cases: Apparently recovered 130, or 85 per cent; disease arrested 14, or 9.2 per cent; greatly improved 7, or 4.6 per cent; improved 2, or 1.2 per cent; failed, none.

Second stage, 124 cases: Apparently recovered 56, or 45.1 per cent; disease arrested 24, or 19.4 per cent; greatly improved 25, or 20.1 per cent; improved 3, or 2.4 per cent; failed 16, or 13 per cent.

Advanced stage, 146 cases: Apparently

recovered 19, or 13 per cent; disease arrested 14, or 9.6 per cent; greatly improved 21, or 14.4 per cent; improved 21, or 14.4 per cent; failed 71, or 48.6 per cent.

For all stages the reported results are: Apparently cured 205, or 48.5 per cent; disease arrested and greatly improved 105, or 24.8 per cent; improved 26, or 6.1 per cent; failed 87, or 20.6 per cent.

In answer to the question of safety and value of the remedy there has been a most uniform agreement, not a single instance of harmful influence, even of a temporary character, having been mentioned, and the value which was uniformly attested appears even without such testimony in the attained results.

A number of the cases had other complications of a tuberculous nature, all of which are given in detail in the full statistical review and tables in the publication referred to. Quite a number of the cases were treated from two to nine years ago. The reporting physicians being in the same locality have been able to watch their progress, and permanency has been claimed in practically all cases which were dismissed as cured, and in a number of those in which the disease was arrested or improved on the discontinuance of treatment.

The remarkable and important feature of enduring results under specific medication is further borne out by the statistics of patients of the Winyah Sanitarium discharged two to ten years ago. A tabulation of 602 cases which had obtained a clinical result while under treatment, and which have been traced, shows that 320 out of 400 patients discharged as apparently cured claimed to have continued in good health, and of the entire 602 cases traced 414 had not relapsed from their condition on discharge, showing permanency for all stages for from two to ten years in 68.8 per cent of the traced cases.

I concede to the observant reader that the number of cases treated by general practitioners at home is comparatively small, but I would suggest that the number of independent observers is comparatively large and that they show a creditable approach to the results obtained by those who have had greater advantages in one way or another. The larger statistics which deal with 3349 cases would justify the belief that further experience will not materially change their average results.

A combination of specific treatment with the usual methods in home treatment of cases appears to me likely to give even better prospects than are indicated above, because the patients are likely to be treated in an earlier stage, which is already apparent from the fact that among the 423 cases treated at home were 153, or 37.5 per cent, in the early stage, whereas in the remaining 2926 cases this was the case in only 27.4 per cent. This difference I believe will grow larger in time, as increasing success will stimulate interest, and the percentage of cured cases will therefore increase.

The scope of the present paper is not calculated to be a detailed analysis; this will be found in the fuller data contained in the study referred to, which gives the name and address of each physician, with the number of cases treated in the different stages and the results he reports in phthisis and other forms of tuberculosis. It also considers fully the question of permanency of my work and of that reported by others, together with the results of blood studies in the light of the development of specific immune substances under the application of specific remedies.

My object here has been to call attention to what may be accomplished in the treatment of phthisis at home, and to show that the general practitioner can improve his results to a degree that in the earlier stages at least permanent recoveries will become the rule instead of rare exceptions, and under conditions which differ in no way from the ordinary, either in special facilities, climate, or expert training and experience.

EDITORIAL.

THE HYPODERMIC USE OF QUININE.

Physicians who practice in northern zones and who rarely if ever come in contact with the malignant or pernicious forms of malarial infection have little conception of the gravity of the illness in patients who are so infected, and fail to appreciate how essential it is to overcome the malarial parasite by the immediate introduction into the blood of adequate doses of the specific remedy, quinine. Because of the fact that sulphate of quinine, which is the salt which has been most commonly employed, is so insoluble and so prone to produce abscess, the hypodermic use of this drug in urgent cases has not met with the favor which it deserves. The hydrochloride of quinine, the bimuriate of quinine and urea, and the hydrobromide of quinine are, however, salts which are so soluble that they do not necessitate the injection of very large quantities of fluid. They seem to be less irritating and they more rarely cause abscess.

We read with a good deal of interest an interesting series of letters in the *Indian Medical Gazette* for March, 1907, contributed by surgeons in the Indian Medical Service, in which they give us the methods and results which they have pursued. One of these, Dr. L. B. Scott, states that he has employed acidified hydrochloride of quinine, dissolved in distilled water in the strength of 1 to 1 or 1 to 2, and that the dose which he is in the habit of giving is 10 grains, which can therefore be readily contained in the barrel of an ordinary 20-minim hypodermic syringe. Occasionally he has used sulphate of quinine, aiding its solution by the addition of 3 grains of tartaric acid to each 10 grains of the salt in 20 minims of water. Sometimes as much as 5 grains of tartaric acid is employed. When large doses are needed, he injects one barrelful, then separates the needle and barrel without removing the needle from the tissues, fills the barrel, and injects a second dose. In some instances, however, tetanus has followed the injection of quinine, and therefore he insists upon the necessity of absolute asepsis both as regards the patient's skin and the needle and syringe. The quinine should be given intramuscularly for the purpose of preventing recurring ague attacks and also to obviate relapse, and he states that this method has put a stop to recurrent ague when doses by the mouth have failed. In one instance he carried out a series of experiments upon 74 successive sepoys coming to a regimental hospital with malarial fever. He treated alternate cases with 10 grains, given twice daily by the mouth, and the other cases by intramuscular injection. In some instances the doses were as small as 2 to 5 grains, but as a rule he gave as much as 10 grains by the needle, or, to be more accurate, 43 per cent of the injections were of 3 to 5 grains and 57 per cent were 8 to 10 grains. Each case received only one injection a day. Taking the average number of days of fever after commencement of treatment, although less than half the dose was used by the intramuscular method the result was distinctly in favor of the use of quinine by the needle, although the time gained was not very noteworthy. Because the drug is so slowly absorbed when given intramuscularly in some cases, he thinks that this method may be advantageous in that it provides a reservoir of quinine which is continuously absorbed and so maintains an antimalarial influence. Further, he states that the planters of Cachar very much favor the injection method as against the oral method.

Surgeon Moncrieff has used a large number of the different salts of quinine by the hypodermic needle, and regards it as a valuable means of combating this infection. The salt which he prefers is the acid hydrobromide, which when dissolved makes a solution of the strength of 1 grain to 7½

minims of water, which quantity of water is excessive, but is used with the deliberate purpose of permitting thorough sterilization by boiling without risk of precipitating the salt. Contrary to what one might expect, he asserts that quinine is more easily given to infants by hypodermic injection than by the mouth, provided that the needle is sharp and of small caliber; and further that these requirements are met by the fine Schimmel needles sold by Parke, Davis & Co. He agrees with Scott in thinking that the hypodermic injection method is not by any means the most rapid way of getting quinine into the system. At one time he considered it the quickest method which could be used next to the intravenous injection, but now he believes that the quinine is so slowly absorbed when given hypodermically that it is not of very great value when the symptoms are urgent. Indeed, he believes that the administration of the drug by the mouth may be more prompt in its effect. He favors the assertion of Holt, of New York, that relatively much larger doses of quinine are required for children than for adults, and recommends that infants of a year should usually receive 8 to 12 grains of the sulphate, or 10 to 14 grains of the bisulphate, daily. He asserts that Holt occasionally gives double this quantity.

This symposium also contains two more letters upon the same subject by East Indian surgeons. Dr. Cook states that he failed to get rid of a severe malarial infection in his own case until he consulted Sir Patrick Manson, who advised the hypodermic use of acid bichloride of quinine, ten grains being injected into the gluteal muscles every night for a week, and effervescing tablets of magnesium sulphate every morning by the mouth. These injections left some soreness and stiffness for a number of days, but were efficacious in curing the fever when the use of the drug by the mouth failed.

Finally, we have the communication of Dr. Williamson, of Bhandara, in which he strongly recommends the bihydrochloride, of which one grain will dissolve in less than a minim of water. He injects 10 to 15 drops of this fluid into one of the larger muscles, such as the biceps or gluteus, under the strictest antiseptic precautions, sterilizing his syringe with boiling olive oil or vaselin before using it, because the temperature of boiling oil is much higher than that of boiling water. He thinks that there is no danger of tetanus if boiling oil is used, his belief being based on his experience in giving many hundreds of intramuscular injections of quinine.

Doubtless many of our readers in the southern portions of the United States, and in tropical countries, will consider that these various communications are of very great practical value, and we have no doubt that the favorable experience of these East Indian surgeons will do much toward popularizing this method of combating malarial disease in suitable cases.

GOOD FOR ONE CONDITION BUT BAD FOR ANOTHER.

We have been somewhat interested by a series of letters which have appeared recently in the *British Medical Journal* in regard to the use of calcium salts as cardiac tonics in pneumonia and heart disease. The subject was first brought forward, at least in the present discussion, by a letter written by Sir Lauder Brunton, in which he advised not only the free use of oxygen and strychnine in many cases of pneumonia, but also the use of calcium chloride, chiefly with the object of obtaining the well-known stimulant effect of this salt upon the cardiac muscle. Sir Lauder Brunton was promptly attacked by Sir James Barr, of Liverpool, who claimed that his suggestion concerning this plan of treatment was by no means original, and that he (Barr) had employed this method a long time before Sir Lauder had published his suggestions concerning it. Sir Lauder Brunton returns to the fray with the statement that he made his contribution solely because he had found these methods of value, that he thought that a certain number of lives could be saved by their use, and as far as priority was concerned he was most happy to recognize the

early use of these substances by Sir James, provided it could be proved that he had employed them at an earlier period. He emphasizes the fact, however, that he recommended calcium chloride as a cardiac tonic, and not because the urine contains a small quantity of chlorides in pneumonia.

Into the debate Dr. Ewart, who is well known to many American physicians, next entered, and sends a letter in which he points out that while it may be correct to consider that calcium chloride exercises a stimulant effect upon the heart muscle, it must not be forgotten, on the other hand, that many practitioners are now employing this salt for the purpose of increasing the coagulability of the blood, and that if it is freely used as advocated by Sir Lauder Brunton and Sir James Barr that most dreaded complication of croupous pneumonia (heart clot) may be precipitated upon the patient. He therefore emphasizes the fact that there is danger in this method as well as value, and that the chief object of the physician should be to maintain, if possible, a steady rate of elimination of the infecting agents and of their toxins, asserting that calcium chloride can have no place in our treatment of the early stages because it will probably increase the exudate within the alveoli. He insists that the more urgent duty of relieving local congestion by leeches, the use of cardiac stimulation, and an endeavor to stimulate excretion in every way, should be the plan of campaign. Finally, he urges, instead of using drugs which will increase the coagulability of the blood, that we employ the citrate and iodide of potassium to diminish the coagulability of the blood, and for the purpose of ultimately aiding in the absorption of the exudate.

THE ALCOHOL QUESTION.

The question as to the moral and medical status of alcohol is still being thrashed out by medical and lay contributors in scientific and popular periodicals, and the thrashing process will probably persist as long as this drug continues to be employed by the laity in beverages. With the moral aspect of the employment of alcohol in cases of disease we have nothing to do, save that it is the duty of the physician to recollect that its careless administration, like the careless administration of all potent drugs, is capable of doing harm, and furthermore is capable in certain persons of developing a habit or appetite, the gratification of which only too frequently leads to disaster for the individual, and those dependent upon him for their existence and happiness.

In this connection we have read with considerable interest an article by Crosby which is published in the *Journal of the Minnesota State Medical Association* of April 15, 1907, in which he does not bring forward any new evidence of his own, but in which he quotes from a considerable number of writers upon this subject in an endeavor to show the attitude of the medical profession in regard to the employment of this drug as a medicine. We have also read with interest an editorial item in *Harper's Weekly* of April 20, 1907, and it is because these two articles in one sense strike a key-note that we call attention to them at this time. There can be no doubt that Emerson was right when he stated that "the reason why artists, poets, and musicians love wine" and other narcotics is because they "add to their normal powers" and "transmute life's leaden metal into gold;" and, again, that "it helps a man to escape the custody of that body in which he is pent up, and that jail yard of individual relations in which he is enclosed." Crosby believes that the evil results of its prescription are incalculably greater than any possible good derived from its use, and quotes a number of clinicians who are using it less and less in their practice.

There can be no doubt whatever that alcohol as a therapeutic agent has been greatly abused in the past, and that many cases of chronic alcoholism have developed from its use as a medicament, but these are not reasons why physicians should refuse to employ it properly and cautiously in certain cases in which clinical experience shows that it is really indicated. We are of the

opinion that, bearing in mind its evil influences and the possibility of the development of a habit, physicians are deliberately failing to recognize a remedial agent of considerable value if with one stroke of the hand they remove it from their materia medica list.

Harper's Weekly, recognizing the everlasting condemnation which is heaped upon alcohol and the equally everlasting persistency in its use by the greater portion of the human race, quotes from a series of contributions made to the London *Lancet* in which it is asserted that alcohol is a trustworthy restorative, and that as an article of diet the moderate use of alcoholic beverages is for adults usually beneficial. This opinion also seems to have found support by the investigations of the *New York Evening Post,* the editor of which submitted these statements to medical practitioners in New York, who, it seems to us, "hit the nail on the head" when they stated that alcohol in limited quantities is good for some people but not for others. As *Harper's Weekly* remarks, "most intelligent observers have noticed this fact for themselves." It is therefore evident that both doctors and laity regard the use of alcohol as a substance which is to be feared, and used with watchfulness and caution. "Harper's" further states that the idea that alcohol is "good for you" is pretty well exploded among people of common sense, but that the idea that it is invariably "bad for you," no matter who you are or how old, does not win its way either in theory or practice. In other words, to quote again from this same periodical, "whether it is good or bad, helpful or hurtful, depends on who and what you are, what age, what temperament, how employed, how fed, and also on what you drink and when and how you drink it." These remarks are essentially sane, and while they are made in connection with the question of the employment of alcohol by the well, they apply with equal force to the use of this drug in those who are ill.

Carefully balanced, well-considered statements of this character do far more good with the vast mass of humanity in governing their use of this drug than bitter denunciation, which often serves to stir up antagonism and destroy confidence in statements which, in some respects, are worthy of credence.

SURGERY OF THE NERVOUS SYSTEM.

The original and illuminating quality of all of Murphy's writings on surgical topics makes his last contribution on Neurological Surgery, profusely and beautifully illustrated (*Surgery, Gynecology, and Obstetrics* for April, 1907), of world-wide interest and importance. Indeed, this is a brochure covering, from the standpoint of the clinician, surgery of the spinal cord and the peripheral nerves. His paper opens with a brief but singularly clear summary of the anatomy of the cord. As to regeneration of the cord Murphy holds that this has never been observed and will not take place. A transverse hemisection of the cord has, however, been followed by restoration of function without the appearance of new fibers in the cicatrix, due to the impulse traveling along the fibers in the uninjured half of the cord, this being in full accord with Weissman's dictum that "Ganglionic nerve-cells, once destroyed in the gray matter of the cord, are never reproduced or replaced." Murphy adds that ganglionic cell-bodies and aneurilemmic axones are never functionally reproduced. This includes all ganglionic cells, the axones of nerves of special sense, and the axones of the white column of the cord.

Division of the anterior root is followed by degeneration of the entire peripheral segment and a small portion of the central segment, generally not extending beyond the first root of Ranvier. The gray matter of the anterior ganglionic cells suffers more or less change. If the ends of the divided motor root are united, restoration of function takes place. This is in strict accordance with the histology and minute anatomy; the axones of the motor nerves are neurilemmic from the time they leave the cord, and should therefore regenerate com-

pletely if accurate aseptic apposition is made. If the motor fiber is divided within the spinal cord restoration never takes place. If the posterior root be divided between the ganglion and the spinal cord the fibers degenerate, and this degeneration affects the cord at the level of division. There is also an ascending degeneration.

In considering trauma of the spinal cord Murphy notes that after contusion there may be absence of signs of an initial injury, till a time varying from a few days to several weeks, when traumatic reaction may set in, and the patient may develop complete paraplegia of both motion and sensation. This may be followed by complete restoration of function without surgical intervention after a period even as long as fourteen months. Such cases are instances of zonal paralysis without division of the cord or axones and are due to an inflammatory condition.

By concussion Murphy implies an impairment or loss of function of the spinal cord due to injury which is not sufficient to produce gross anatomic changes. He accepts as spinal concussion cases other than those with symptoms of pronounced zonal hyperesthesia or anesthesia and with a zone of diminished reflex, or paralysis partial or complete. Hemorrhage may produce identical symptoms; hence diagnosis at first may be quite impossible. Later it will be suggested by a rapid disappearance of all the symptoms in cases of pure concussion.

Murphy states he has had a number of cases of injury of the spine in which physical examination did not reveal evidence of dislocation or fractures, although the patients developed marked paralytic symptoms. In all these cases perfect recovery took place in six to twenty months.

Of punctured wounds of the cord Murphy notes that Wagner-Stolper has collected 86 cases. Of these, more than half occupy the cervical portion and the remainder the upper dorsal region. The clinical picture of punctured wounds of the cord is that of a hemisection lesion. The symptoms appear immediately after the injury, and the course is generally an aseptic one. The mortality was 20 per cent. Very few of the cases recovered completely.

Treatment lies in keeping the external wound clean; nor is operation ever indicated except when infection of the spinal canal has occurred, or when there is compression from hemorrhage. The latter if manifested early can be relieved by puncture with a large needle. Since the divided axones do not regenerate, as they have no neurilemma, suture of the severed segments is not only useless but adds to the danger. Such paralysis as results from effusion or traumatic zonal inflammation will subside without operation. Therefore laminectomy is contraindicated.

Effusion of blood may be extradural, subdural, or within the cord. The subdural hemorrhage, or hematorrhachis, is characterized by gradual and progressive onset of paraplegia after injury, attended by violent pain along the nerves and occasionally by violent muscular spasms. The symptoms increase in severity up to the fourth day and then gradually disappear. The best test for hemorrhage is lumbar puncture. This hemorrhage is occasionally non-traumatic in origin, Janeway having reported a case of spontaneous subarachnoid hemorrhage in a hemophilic. This patient after having recovered from an attack of influenza suddenly fell to the floor. The autopsy revealed extensive hemorrhage in the subarachnoid space up to the middle cervical region; there was also some blood between the dura and the arachnoid.

Hemorrhage into the substance of the cord, hematomyelia, is commonly noted in the region of the fourth, fifth, and sixth cervical vertebræ. It is customarily due to overflexion of the spine. When bleeding is confined to the gray substance only there is wasting of muscle and anesthesia of the upper limb; also zonal absence of reflexes. If the white substance be involved, we have paraplegia below the level of the lesion. Prognosis must be guarded in cases of hematomyelia. Even though recovery occur there is always a weakness left, due to destruction of the ganglion cells of the motor neurones at the point of hemorrhage.

Fracture of the spinal cord is commonest in the dorsolumbar region. When it is followed by immediate purulent, uniformly transverse, and complete paralysis of motion and sensation there is no hope of recovery with or without operation, as the spinal cord is divided. Surgical intervention is of value only where the fragments press upon the cord without having caused complete division. Fracture with a contusion rarely gives immediate and complete palsy. Irregularities of paralysis indicate that some columns of the cord are still intact; usually this paralysis comes on hours, days, or weeks after the trauma, and is accompanied by abolished reflexes in this zone. Compression may be associated with contusion, under which circumstance the differential diagnosis is practically impossible without laminectomy, which is to be avoided, since a contused cord suffers additional insult by every operation, no matter how delicately performed. Where, however, compression is suspected on account of great bone displacement, the operation is advisable. Partial division of the cord gives a symptom-complex resembling contusion, there being an irregularity in the transverse line of paralysis, and either sensation or motion may be present to a limited degree. Murphy quotes Walton to the effect that "we have no symptoms from which we can assert from the outset that the cord is crushed beyond at least a certain degree of repair. It has been said that where there is complete loss of sensation, motion, and patellar reflexes the cord is completely crushed, and, consequently, recovery cannot be expected."

Murphy particularly condemns, in fractures with division of the cord, operation with suture of the cord as being absolutely worthless.

When the fracture occurs in or below the twelfth dorsal the treatment and prognosis are entirely altered. The cauda equina is made up of essentially peripheral nerve fasciculi, and not of spinal cord fasciculi, as the axones of the motor roots in this portion have their ganglion trophic cells above this level in the conus, and the motor axones in the cauda are covered with the sheath of Schwann, or neurilemma. These nerves have the same power of regeneration as the peripheral motor axones. Hence accurate suture and exact approximation of the ends of the divided caudal fasciculi under aseptic conditions are distinctly indicated.

Murphy states that it is easy to determine which are the right and left fasciculi by a mild faradic current up to the seventh day after the injury. He strongly urges that every case of fracture, stab, or bullet wound, where the cauda has been supposedly divided, should be exposed and suture of the fasciculi undertaken, the individual points of suture to be surrounded by egg membrane to lessen connective-tissue interposition.

Murphy quotes Prewett's collection of 49 cases of gunshot injuries treated since the antiseptic era. He urges from his own standpoint that in bullet wounds involving the spinal cord itself operation is contraindicated, unless the bullet remains within the spinal canal and compresses the cord. If the cord be compressed by accumulated blood within the meninges, a lumbar puncture for its relief is indicated. The blood is kept fluid by its intermixture with the cerebrospinal fluid.

Murphy alludes briefly to the causes of death after spinal injury, and especially warns against the use of the catheter, holding that if the bladder be allowed to overflow infection is not so likely to take place. He notes that relaxation of the vesical sphincter is favored by transproctal massage. Decubitus can be retarded or avoided by the water-bed or air-cushion, frequent changes of position, and by dermal cleanliness.

As to syringomyelia, Murphy believes that this disease in its circumscribed form offers a field for surgical intervention. As soon as opportunity presents itself he will perform a subdural drainage with an unabsorbable seton, which will keep a permanent communication between the syringomyelic canal and subdural space, and insure an equalization of pressure, which should

stop the advancement of the disease, even if it does not permit restoration of function, in some of the compressed ganglion cells and axones.

As to the paraplegia of spinal caries, Murphy advocates a simple laminectomy, displacement of the cord to one side, exposure of the granuloma, removal with a bone curette, filling the cavity with a Moorhof plug, and closure of the wound without drainage. He favors removing the laminæ and spinous processes completely. In acute meningitis he formulates the indications for operation as follows:

Lumbar spinal puncture is advised for the diagnosis as well as for the relief of cerebrospinal tension. Large quantities of fluid may be withdrawn at individual sittings, and the sittings may be as frequent as the symptoms of cerebral pressure occur. A cannula with a double opening at its lower end may be substituted for the needle in cases of rapidly recurring hyperpressure. This must be very cautiously protected against the entrance of air and microörganisms.

Continuous drainage of the spinal canal with secondary drainage of the ventricles may be established by a laminectomy with the insertion of a very small tube. This, however, will be rarely indicated if the cannula is used judiciously and to its best purpose.

Transoccipital ventricular drainage can be made through a musculocutaneous flap with a trephine opening in the occipital bone to the right or left of the median line, an inch posterior to the foramen magnum. The dura may then be incised, the bony opening enlarged with bone forceps, the velum exposed and opened if indicated, or the tube may be inserted in the subarachnoid space without opening the velum. This treatment can be utilized in connection with spinal puncture or laminectomy.

Transparietal ventricular drainage can be established by following the description given in the average work on surgery for the insertion of the tube into the lateral ventricles. A small trephine opening is all that is necessary for this procedure. It is an operation that will be rarely undertaken, as lateral ventricular drainage is not often indicated in meningeal infections. The duration of the drainage is governed by the general surgical principles of drainage. Murphy prefers rubber to the metallic type of drain.

In performing laminectomy for continuous drainage or irrigation the body must be so placed as to give the maximum convexity to the lumbosacral region. A U-shaped incision three inches long is made over the sacral region, the most convex portions of the curve touching the last sacral tubercles, while the branches of the U run upward along the line of the posteroexternal tubercles of the sacrum.

The skin, subcutaneous tissue, fat, and muscles are divided down to the bone, and the flap is dissected until the sacral foramina are exposed. With the bone-cutting forceps, one blade in the sacral canal, the laminæ are divided on either side until the sacral dura is exposed at the third body. This is easily accomplished. The sacral dura bulges very conspicuously in the field, and corresponds to the middle of the third sacral body one and a half inches from the coccygeal tubercles (or lower posterointernal tubercles of sacrum). It forms quite a large sac or pouch, which is called the sacral cerebrospinal cistern. Before opening the cistern it is advisable to aspirate the blood by a siphon lying in the wound, so as to have a clear view. In fact, the siphon should always be in action for the clearing of the operative field when this is deeply situated. The dural sac is split parallel to its long axis, sufficient cerebrospinal fluid is allowed to escape to relieve tension, and an artery forceps put on the opening so as to close it temporarily.

If it be deemed advisable to perform in connection with this operation transoccipital drainage, an incision is made parallel to and below the occipital ridge on one side down to the bone. The horizontal incision is joined by a vertical one along the middle of the occipital bone, prolonged down to within one-half inch of the foramen magnum. After dissecting and reflecting the

musculocutaneous flap downward, the occipital bone is trephined either over the left or right cerebellar fossa, close to the middle line. The bone is comparatively thin at this point, and the openings are easily made and enlarged to the desired size. The dura at this point bulges conspicuously over what is commonly known as the cerebellar cistern. It is incised with a small scalpel, and if through-and-through irrigation be indicated the blunt point of a common intravenous transfusion outfit, connected with a fountain syringe of normal salt solution, is introduced into the opening. The fluid is allowed to flow through the spinal canal with the desired pressure readily regulated by the height at which the can is held. In order to demonstrate the certainty of the flow from the subdural cerebellar cistern into the spinal canal and down to the sacral cistern, it may be colored with carmine. Tubes can be inserted into both cerebellar and sacral openings and kept in place, the cerebrospinal fluid tension being regulated by clamps on the tubes. The irrigation may not be needed, as a simple drainage with relief of pressure or pus tension is often all that is required to conduct to a cure. It is the tension that favors absorption and tissue necrosis, and tiding over the primary acute pressure of the products of infection is life-saving.

If the foramen of Magendie is closed, a V-shaped piece of the velum can readily be removed with the scissors, establishing a direct communication from the fourth ventricle to the subcerebellar cistern. This operation should be performed in every case of central hydrocephalus, whether of tuberculous or traumatic origin. Eleven years ago Murphy performed it for the first time, and the patient, who was almost blind from a rapidly increasing optic atrophy, retained the then remaining fragmentary vision, was relieved of his periodical, maniacal headaches, and enjoyed perfect freedom from all of the symptoms during the succeeding years. This shows that when optic atrophy is threatened from a ventricular fluid retention, excision of the velum should be resorted to; it is neither difficult of execution nor dangerous to the patient. Asepsis is a requirement to success. Central ventricular drainage cannot be maintained with the foramen of Magendie occluded. The velum should be divided freely in all cases of leptomeningitis, when closure is suspected.

In spina bifida Murphy advises excision of the sac, which is best attacked from the side, because the fibers of the cord are more frequently spread and attached to the median portion of the posterior wall, within the line of embryonal cleavage. When the sac is pedunculated it should be first freed from its attachment to the skin and neighboring structures, except its highest point, which is adherent to the skin; there an elliptical cutaneous flap should be permitted to remain attached to the sac. When the latter is freed to a level with the cord, a provisional ligature should be thrown about its neck without tying. The sac should be opened, carefully examined, and if the cord is not protruding the ligatures should be firmly tied; an overstitch of catgut should give it additional support. If the base is broad, the same procedure should be followed, except that after opening the sac and inspecting it the ligature should be removed. It should then be amputated at its base and carefully sutured. If it be a case of syringomyelia, and if the cord protrudes into the sac, the fibers of the cord should be freed from their attachment to the meninges and placed in their normal position, and the opening in the sac closed with a continuous chromic catgut, or, preferably, kangaroo-tendon suture. If a complete syringomyelia exist, the cord should be amputated in both directions from the center of elevation to a normal anatomic zone; then a careful end-to-end suture of fibers should be made if the spina bifida be situated in the caudal zone. If above the caudal zone, the cord should be freed and replaced within the dural sac without suture, and the opening closed, with no hope of motor improvement offered the patient. In localizing the muscles supplied by the distal fibers the faradic current should be used. Results have been most satisfactory

after this technique, both immediate and remote.

Murphy's description of the symptomatology of tumors of the spinal cord is extremely vivid and clear.

As to the therapeutics, his advice here is characteristically rational and practicable. In all cases of tumors it is advisable to give antisyphilitic treatment for a period of three or four weeks. If no amelioration is obtained no further attempt should be made. Gummata are not common, as can be seen from Schlessinger's table of four hundred cases of tumors, of which twenty-one were syphilitic. These statistics show that only one case in twenty should be relieved by this treatment. The policy of "benefit-of-the-doubt" treatment is very frequently fatal, because much precious time is lost. It should also be remembered that a mass resulting from tuberculous decay may form a circumscribed granuloma acting as a tumor and pressing upon the anterior portion of the cord. If such a tumor does not improve by medical and hygienic treatment, immobilization of the spine, and relief of local pressure, then the granuloma must practically be regarded as a tumor, and as such removed by laminectomy. The next step in the consideration of surgical intervention is to ascertain whether a tumor is single or multiple, benign or malign. It can readily be understood that multiple tumors situated in distant segments are not amenable to treatment. Malign tumors should be removed only if circumscribed. It is most important of all to know which tissue is involved and to what extent.

As to the peripheral nerves, after a brief description of the anatomy and a most interesting discussion of the theories of degeneration and regeneration, Murphy discusses the whole subject from the standpoint of the practicing surgeon. He ends his paper by conclusions which in the main will be accepted as final most readily by those with largest experience. Among these conclusions perhaps the one of major importance is to the effect that the greatest barrier to axonal functional regeneration is the interposition of connective tissue. Primary union is a *sine qua non,* and moreover every nerve union should be surrounded by a guard against the intervention of collateral connective tissue. Nerve suture without infection and without the interposition of connective tissue can be made as uniformly successful as are bone unions under similar conditions. The earlier nerve union is reëstablished, the more rapid and certain the restoration of function.

This article has been given this extended notice because it is the most recent, the most practical, the best illustrated, the most essentially clinical article on nerve surgery that has appeared. It is worthy of careful study, every word of it.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF NEURALGIAS WITH INJECTIONS OF ALCOHOL.

HAUCK states in the *Lancet-Clinic* of December 1, 1906, that he was called upon to accompany a patient to Munich, Germany, where he placed himself in the hands of Schloesser for the treatment of a trigeminal neuralgia of about twelve years' standing. Mr. H. had been operated on for the first time about ten years ago, when the supraorbital and infraorbital nerves were thoroughly resected. For two years he was free from his trouble, and then after severe exposure the pains returned.

With intermissions his trouble gradually increased until two years ago, when another removal of nerves was done. This operation relieved only the twitching of the eyelid but not the pain, which increased until it was unbearable. The writer saw him first about the end of May, when he had been unable to sleep for six days. Nothing he gave him relieved him to any great extent, but he procured from four to six hours' sleep at night and several hours during the day under the effect of potassium bromide and chloral.

When he heard that Schloesser, of Munich, was successfully relieving neuralgias by means of injections he insisted upon the writer taking him there. As removal of the ganglion had been advised against on account of his age, seventy-six years, and as nothing seemed to relieve him, the writer consented.

His case proved to be a very obstinate one, and not until all three branches of the fifth nerve had been injected and the scars of former operations infiltrated did he find relief.

The method pursued was to inject from ten to thirty minims of 80-per-cent alcohol into the nerves where they leave the skull. This is done by means of specially constructed needles.

The addition of cocaine or stovaine, as used by Oswalt, the author considers unnecessary and possibly dangerous. The alcohol alone relieves the pain within a few seconds after coming into contact with the nerve trunk, even when a spasm of pain exists at the time that injection is commenced. The site for injecting selected by Oswalt is, in the opinion of the author, not so well chosen, nor is the injection so easy of accomplishment there as at the several sites selected by Schloesser. Schloesser assured the writer that he had a record of 100 per cent of cures to his credit since he commenced the use of alcohol injections about four years ago.

On the author's return it was his fortune to have Mr. J. R., aged sixty, referred to him for treatment. He had suffered almost continuously since 1893 with pains in the upper and lower jaw on the left side. Believing the teeth at fault he had had them all removed, but without obtaining relief. Various plans of treatment had been tried with no, or only temporary, relief. When the writer saw him, on October 1, he was unable to speak or swallow without bringing on a severe attack of pain. He complained most of the pain over the mental foramen. His sleep was much disturbed by attacks of pain at night, and eating was a torture. The author injected ten minims of 80-per-cent alcohol into the mental foramen.

October 3. Pains less, slept better, no pain at site of injection, but some now especially over the left cheek. Injected 15 minims of the solution into the infraorbital foramen.

October 8. Patient has been more comfortable, but still cannot speak or eat without pain. Injected 20 minims of the solution into the second branch of the fifth nerve, where it emerges from the skull through the foramen rotundum.

October 12. He has been much relieved by last injection, but still has pain on swal-

lowing. Injected 20 minims of solution into third branch of fifth nerve where it leaves the foramen ovale.

October 16. Since the last injection he has had no pain or neuralgic attack. He speaks and eats without pain and sleeps "like a baby," as he expresses it.

The only thing complained of is the numbness of all parts supplied by the second and third branches of the fifth nerve. As the first branch was never affected, it was not injected.

From what the author has seen and heard it seems to him that the removal of the Gasserian ganglion is an unwarranted and unnecessary operation. It also goes far toward proving that the seat of disease lies not in the ganglion, but in the nerves.

Drs. Mayo assured the writer that they seldom found it necessary to remove the ganglion, and now operated by plugging the foramina to obstruct the reunion of the nerves.

Dr. Ferguson, the author is told, is using hot saline solution in place of alcohol. Osmic acid has been tried, but relapses have been the rule within a short time.

Ether, carbolic acid, cocaine, chloroform, etc., have all been tried and discarded. The injections of 80-per-cent alcohol can be as successfully used in sciatica and other forms of neuralgia.

THE TREATMENT OF SOME OF THE FORMS OF GOUT.

LUFF in the *Practitioner* for February, 1907, tells us that the treatment of gout should have for its aim the following objects: (1) The treatment of the gouty paroxysm in cases of acute gout, and the relief of the pain as speedily as possible; (2) the treatment of the subacute or chronic condition, and the prevention of the recurrence of an attack; (3) the treatment of the affected joint, or joints, with the object of removing the uratic deposits, and of preventing permanent deformity; and (4) the treatment of the various forms of irregular or abarticular gout.

The Treatment of Acute Gout.—In order to arrest the abnormal intestinal fermentation, to remove the excessive numbers of intestinal bacteria, and to relieve the catarrh of the intestinal mucosa, all factors in the development of abnormal intestinal toxins, the bowels should be freely opened with four grains of calomel or "blue pill," followed by a saline aperient. For the first twenty-four hours it is preferable that no food should be taken, but water should be drunk freely.

For the treatment of the gouty paroxysm, the limb should be placed in the horizontal position, or slightly elevated above the level of the body, and a cradle should be arranged so as to take the weight of the bedclothes from the affected joint, warm packs should be arranged around it, consisting of cotton-wool saturated with a soothing lotion, and then lightly covered with oiled silk. The author has found the following lotion most useful:

℞ Sodii carbonatis, ʒiij;
Linimentum belladonnæ, f ʒij;
Tincturæ opii, f ʒij;
Aquæ destillatæ, q. s. ad f ʒviij.

A small portion of the lotion should be mixed with an equal quantity of hot water, and then poured on cotton-wool previously arranged round the joint. The pack should be changed every four hours. In connection with the acute paroxysm, no attempt at local depletion, such as the application of leeches to the inflamed joint, blistering, or incisions, should on any account be made, owing to the great liability of thereby extending the inflammatory condition, and so producing subsequent ankylosis or deformity.

For the internal treatment of acute gout, colchicum is one of the most valuable drugs that we possess. It should be especially used for acute gout, and for subacute attacks supervening on chronic gout. If it is used continuously, tolerance is apt to be acquired, and then the drug ceases to act. At the commencement a large dose of 30 to 40 minims of colchicum wine should be given, followed by a mixture containing in each dose 15 to 20 minims of the wine, with from 40 to 60 grains of citrate of potassium, which should be administered three

times a day. The citrate of potassium, which is given for its combined properties of acting as a diuretic and of diminishing the acidity of the urine, may, if desired, be given as an effervescing mixture, using 30 grains of potassium bicarbonate to 20 grains of citric acid. Colchicum reduces the gouty inflammation, relieves the pain, and shortens the attack. It should only be taken under medical advice, and should never be given in such doses as to produce extreme depression. After the inflammation of an acute attack has subsided, the doses of colchicum should be gradually diminished until the drug is left off. A very useful method of administering colchicum is in the form of its active principle, colchicine, which may be given in doses of one-fiftieth to one-eightieth of a grain three or four times a day immediately after food. Only a few patients will tolerate doses of one-fiftieth of a grain, the contraindication to such a dose being the production of diarrhea and intestinal griping. The following constitutes a very useful pill:

℞ Colchicinæ, gr. 1/60;
Ext. nucis vom., gr. ¼;
Ext. hyoscyami, gr. ½;
Ext. gentianæ, gr. 1.

After the initial free purgation, as previously mentioned, it is not desirable to produce too free an action of the bowels. All that is necessary is to have a sufficient action to relieve portal congestion and intestinal catarrh. The following pill effects this purpose, in most cases, very well. It is administered at night, and is followed up, when necessary, by a dose of saline in the morning:

℞ Leptandrini, gr. j;
Iridini, gr. j;
Ext. hyoscyami, gr. j;
Ext. colocynth. co., gr. jss.

If the pain of an acute attack of gout is so severe as to prevent sleep, seven grains of veronal, or ten grains of trional, may be given, or a full dose of extract of hyoscyamus will, in some cases, act as a very useful anodyne. The administration of opium or morphine should, if possible, be avoided, owing to the risk of its deficient elimination, and also on account of its diminishing the amount of urine, and its tendency to derange digestion and to check hepatic metabolism.

POSTPARTUM HEMORRHAGE.

The *British Medical Journal* of January 26, 1907, contains an article by LE PAGE on this topic. Taking the steps in their order, the author advocates raising the pelvis to cause blood to gravitate toward the heart and brain, and to prevent bleeding from the uterine and ovarian veins. The aorta is compressed to immediately arrest arterial hemorrhage. The spinal column beneath and below the umbilicus is very prominent and broad, and for the length of three or four inches forms an admirable *point de résistance,* for the aorta lies immediately over it. Compression is best made by the outer, the ulnar, portion of the left clenched hand, than which nothing could be more convenient and effective. Pressure should at short intervals be made to slide from one part to another of the available three or four inches, that no injury be done to the sympathetic system of nerves which forms a network around the vessel, and should be continued until uterine contraction is secured, even if this be delayed for one or two hours. Its release must always be very gradual; the greatest care in this particular is essential. An important fact is that, although no blood is allowed to pass the compressing hand, there is still a sufficient, but very limited, flow through the ovarian arteries to maintain uterine vitality.

He raises the legs and arms to transmit their blood into the trunk, and then bandages them firmly to prevent the return of blood when they are lowered. The effect of this maneuver is that in many cases a tension of the blood stream approaching the normal is attained in one or two minutes. Ergot and other remedial measures are at once available.

The hand, rendered aseptic, is then very carefully passed into the uterus—first, to detect any possible laceration of the body or cervix or any remaining portion of placenta; and secondly, to afford a *point d'appui* for grasping and compressing the

uterus from outside. Having elevated the pelvis and limbs, it may be thought by some that it is unnecessary to firmly bandage. This is not so, for it would be impossible to keep the patient in that position for any considerable time, and to lower them would be to endanger her from syncope; nor is the tourniquet allowable, for it is altogether necessary to observe great caution in restoring the circulation—that is, in allowing the blood to be taken from the trunk slowly and in a ratio with the increase of its volume by absorption and assimilation.

The vast advantages of this intrafusion of whole blood are: In extreme cases tension in the vessels is immediately restored, and the heart and lungs are filled with whole, normal blood. The paramount importance of this must be evident. Contrasted with the intravenous injection of saline fluid or the intercellular injection of other fluids, it should be obvious that whilst the latter comparatively slowly increases the bulk of fluid, blood both supplies resistance for the heart to act upon and is that alone through which a normal vital condition can be restored, and the nerve centers develop that energy without which the uterine muscle cannot contract and retract.

This treatment—which he submits is rational, always practicable, and, so far as his experience goes, unfailing—is based on the proposition: That no work can be done without energy; that there is no energy inherent in uterine muscle; that contraction of the uterus is wholly dependent on energy derived from the uterine nerve centers; that, deprived of blood, nerve centers do not, and cannot, develop energy; and that, in the collapse of profuse hemorrhage, there is practically stasis in the vascular system which supplies the nerve centers. Therefore, as depletion of blood is rapidly going on, instantly arrest the flow; as nerve centers are paralyzed, restore their vitality; and lastly, as the uterine muscle is uncontracted, now that the patient is safe, and innervation is reëstablished, use such measures as may be necessary to secure normal firm contraction.

The personal experience of the author, derived from the responsibility for about 5000 parturitions, has so far attested the soundness of this theory and afforded proof of its practicability, in that he has never seen a death from postpartum hemorrhage.

VACCINATION OF THE CORNEA.

MENZIES and JAMESON in the *British Medical Journal* of January 26, 1907, make the following report:

Accidental inoculation of some part of the conjunctiva with vaccine is occasionally reported, but the authors have been unable, in the literature at their command, to find a definite description of such an accident affecting the cornea. There is a short report in the *Lancet* (1906, i, p. 999) of a case of accidental vaccination of "the eye," in which it is stated that the resulting impairment of vision would have been worse but for the fact that the patient had been vaccinated two years before. Aron has reported a case in which the cornea was so seriously affected that permanent opacity could not be avoided. In both of these cases the cornea may have been the site of inoculation, but whether that be so or not the condition is so rare that it seems desirable to record the following case:

On February 27, 1906, Dr. Jameson was breaking a tube of lymph, when a fragment of the tube flew into his right eye. The eye was promptly washed out, and there was no further discomfort till March 4, when there was some indistinctness of vision due to monocular diplopia. Vision, nevertheless, was 6/6, and nothing abnormal appeared on examination. On the following day there was a small circular area, the size of an ordinary pin-head, bare of epithelium in the lower outer quadrant of the cornea. For three days this area gradually increased in extent, till it occupied one-fourth of the total area of the cornea. There was no infiltration of the corneal substance, but considerable conjunctival injection. On March 9 chemosis and edema of the lids became marked, and about this time and for several days the preauricular gland was enlarged and tender. The chemosis and edema remained at their maximum

till March 15, and then during the following ten days slowly diminished, but during all this time the denuded area of the cornea remained bare of epithelium. Finally, on March 25, the epithelium began to spread over the exposed corneal surface. Growth took place chiefly from above and below, very slightly from the sides of the patch. As compared with regeneration after injury, the rate of progress was slow, and it was March 30 before the process was complete. Although no infiltration or loss of the corneal substance had been observed, the regenerated epithelium had a "matt" surface. Unfortunately, recovery was retarded by the occurrence of a secondary ulceration of the affected area. On April 20 the spot became infiltrated, and an ulcer developed which showed no definite sign of healing for about three weeks, and was largely responsible for the impairment of vision. By May 10, however, the ulcer was healing satisfactorily, and the patient was ultimately able to resume work on June 13, although the eye continued weak, and dark glasses had still to be worn for a time. During the acute stage the pupil never dilated fully with atropine, and there was a considerable amount of iritic pain, but there was no exudation or synechia. On June 29 vision was J. 14 (letters), on September 7 it had improved to 6/36, on September 25 to 6/24 (one letter), and on December 13 it was 6/18.

The accompanying symptoms were chiefly photophobia, epiphora, and pain. The epiphora was one of the earliest symptoms, and persisted to the end. It was continuous and very troublesome. The pain was twofold: (1) a superficial burning and smarting which often kept the patient awake at night, even after healing had taken place; and (2) iritic pain, which had to be controlled by very free use of atropine.

As regards treatment there is not much to be said. The eye was kept clean throughout by means of frequent ablutions with warm boric lotion. Atropine was essential to control the iritic pain. At one time it produced a considerable rash, and duboisine was substituted, but proved ineffectual. On Dr. Glasscott's suggestion the atropine was resumed in the form of ointment, and this proved less irritating. At an early stage argyrol was used as a possible means of destroying the vaccinal poison, and it was continued throughout the acute stage, but for no better reason than that when it was discontinued progress did not seem to be so favorable.

THE TREATMENT OF ARTERIAL HYPERTENSION.

JANEWAY in the *New York Medical Journal* of February 2, 1907, asks and answers the question, how shall a wise physician act in the presence of marked hypertension? First of all he must institute preventive treatment, which shall limit further mischief, check the development of the underlying kidney lesion, and hinder secondary degenerative changes in arteries and heart. The author touches upon this only in its larger outlines. Diet is most important, and should be carefully planned to attain physiological economy of nutrition, particularly of proteid metabolism. All kidney irritants and substances difficult of elimination in the urine must be interdicted. Von Noorden has shown the need for moderation in the total fluid taken. Alcohol is usually, though not invariably, unwise. Occupation requires supervision, since prolonged or arduous mental work and excitement tend to raise blood-pressure strikingly. On the other hand, hard physical labor entails too much strain on the already hypertrophied heart. Moderation is the desideratum; sufficient congenial occupation and moderate physical exercise are valuable means of prolonging life. One frequently sees active men of affairs, who give up all business rather suddenly, go to pieces more rapidly than would have been expected had they kept under full steam. Where exercise is not well borne, on account of beginning heart weakness or for any reason, massage is needed to keep up the venous and lymphatic circulation and the muscular nutrition. The author recalls many examples of its favorable nutrition.

Tobacco is best sharply restricted, since it has a marked hypertensive effect. Strain-

ing at stool must be forbidden, and the need for it forestalled by laxatives. Cold baths agree with some of these patients, but as a rule those of neutral temperature are better. Similarly, a warm climate for the winter is advantageous. With such a regimen one often has the gratifying experience of seeing a gradual fall in blood-pressure, together with an improvement in the patient's strength and *bien aise*.

As to drugs, the iodides, in small doses, long continued, seem to belong among the preventive measures. Their action is little understood, but probably affects the nutrition of the vessels. Animals given adrenalin injections are said to develop arteriosclerotic changes more slowly when iodides are given simultaneously. They have no direct effect on blood-pressure.

Where no symptoms of a threatening nature exist, these preventive measures alone are called for. Under such circumstances a systolic blood-pressure of 200 mm.—yes, even of 250 mm. and over—is not incompatible with a number of years of comparative comfort and activity, particularly if the response to treatment is favorable and the patient coöperates heartily.

Of the dangerous accidents which befall persons with hypertension, such as cerebral or other hemorrhage, uremic convulsions, anginal seizures, acute pulmonary edema, and the like, the author does not think it necessary to speak here. In the presence of peril to life itself, the vasodilators must be used freely and without hesitation. One, however, should not stop at even large doses, if the symptoms continue; though blood-pressure observations, when possible, are an excellent guide to dosage. Venesection, particularly in acute uremia, has a marked hypotensive action. One simple therapeutical measure deserves special mention—rest in bed. In the exacerbations of a chronic nephritis, so common in hospital practice, bed and a milk diet often suffice to reduce the pressure strikingly, without any other treatment.

In the majority of our patients, however, the danger most to be dreaded lies in another quarter. It is the onset of gradual insufficiency of the left ventricle, with secondary failure of the right ventricle, general venous stasis, and all the phenomena of an uncompensated cardiac lesion. In fact, hypertension and an aortic stenosis are mechanically similar in their effect on the heart. Just under these conditions a failure to recognize the compensatory nature of hypertension and the necessity for its maintenance works the greatest harm. Beginning asystole often leads to a slight fall in pressure, which is considered evidence of improvement; or, if the patient is seen first with marked heart weakness and high blood-pressure is found, which may still be below the level that individual requires, nitroglycerin and similar drugs are given, to "let up on the work of the heart," while digitalis is withheld. If digitalis be given and fail, it may prove, and often is, an inefficient preparation. Of one thing the author is convinced: with the appearance of edema and diminished urine, digitalis, best in the form of a freshly made infusion from good English leaves, is urgently indicated. In some cases in which the blood-pressure is very high it may be wise to give vasodilators at the same time, but never to the point of lowering the tension. Rest in bed and marked restriction in the quantity of fluid taken should never be forgotten. Under such circumstances a rise in blood-pressure is to be welcomed as a sign of change in the right direction, and will usually coincide with the establishment of diuresis and the absorption of the edema.

THE PHYSIOLOGICAL EFFECT OF ALCOHOL ON THE ANIMAL BODY.

HALL, in the *Journal of the American Medical Association* of February 2, 1907, gives the following summary of this subject as he sees it:

The Effect on Nutrition.—The first question that arises in this connection is an old one: Is alcohol a food?

Ethyl alcohol possesses several characteristics in common with the carbonaceous foods, *e.g.*: (1) it is composed of C, H, and O; (2) it is readily oxidized in the liver, yielding CO_2 and H_2O, which are excreted;

(3) it yields heat incident to its oxidation, and this heat naturally augments the body income of heat; (4) ingestion of ethyl alcohol leads to a decrease in the catabolism of carbonaceous foods and may even "spare" proteins.

In this connection one must not lose sight of the following facts:

1. All vegetable toxins and alkaloids are composed of the same kind of chemical elements as enter into foodstuffs, viz., C, H, O, and N.

2. Toxins and alkaloidal poisons in general are oxidized in the liver, through the agency of oxidases, whose function is to oxidize and thus to make harmless substances which would act as protoplastic poisons on all cells with which they come in contact. When moderate amounts of such toxins are taken the defenses of the system are sufficient to reduce them to a harmless condition and no immediate injury results. If larger quantities are ingested the full drug effect (narcotic in the case of alcohol) is immediately experienced, the oxidases of the system being unable to defend it against a large dose.

3. All oxidation yields heat, whether it is a normal catabolism or a protective oxidation. That the heat from the oxidation of alcohol is not a normal catabolism for the purpose of heat liberation is evident from the fact that, notwithstanding the liberation of heat through oxidation of alcohol, the temperature of the body falls, because of increased loss of heat from the surface. This increased loss is due to dilatation of peripheral vessels.

4. Decreased catabolism of carbonaceous or nitrogenous foods following ingestion of a narcotic is a universal fact depending on the drug effect and giving to the oxidized narcotic no significance as a food. It may be said without reservation that ethyl alcohol is not a food in the scientific significance of the word. Hall regards the following as statements of demonstrated facts:

So many antitheses between alcohol and food are noted that there is an inclination to try the deadly parallel on the two substances.

FOOD.	ALCOHOL.
1. A certain quantity will produce a certain effect at first, and the same quantity will always produce the same effect in the healthy body.	1. A certain quantity will produce a certain effect at first, but it requires more and more to produce the same effect when the drug is used habitually.
2. The habitual use of food never induces an uncontrollable desire for it, in ever-increasing amounts.	2. When used habitually it is likely to induce an uncontrollable desire for more, in ever-increasing amounts.
3. After its habitual use a sudden total abstinence never causes any derangement of the central nervous system.	3. After its habitual use a sudden total abstinence is likely to cause a serious derangement of the central nervous system.
4. Foods are oxidized slowly in the body.	4. Alcohol is oxidized rapidly in the body.
5. Foods, being useful, are stored in the body.	5. Alcohol, not being useful, is not stored in the body.
6. Foods are the products of constructive activity of protoplasm in the presence of abundant oxygen.	6. Alcohol is a product of decomposition of food in the presence of a scarcity of oxygen.
7. Foods (except meats) are formed in nature for nourishment of living organisms, and are, therefore, inherently wholesome.	7. Alcohol is formed in nature only as an excretion. It is, therefore, in common with all excretions, poisonous.
8. The regular ingestion of food is beneficial to the healthy body, but may be deleterious in the sick.	8. The regular ingestion of alcohol is deleterious to the healthy body, but may be beneficial to the sick (through its drug action).
9. The use of foods is followed by no reaction.	9. The use of alcohol, in common with narcotics in general, is followed by a reaction.
10. The use of food is followed by an increased activity of the muscle cells and brain cells.	10. The use of alcohol is followed by a decrease in the activity of the muscle cells and brain cells.
11. The use of food is followed by an increase in the excretion of CO_2.	11. The use of alcohol is followed by a decrease in the excretion of CO_2.
12. The use of food may be followed by accumulation of fat, notwithstanding increased activity.	12. The use of alcohol is usually followed by an accumulation of fat through decreased activity.
13. The use of food is followed by a rise in body temperature.	13. The use of alcohol may be followed by a fall in body temperature.
14. The use of food strengthens and steadies the muscles.	14. The use of alcohol weakens and unsteadies the muscles.
15. The use of food makes the brain more active and accurate.	15. The use of alcohol makes the brain less active and accurate.

DISINFECTANTS AND DISINFECTION.

ALBERT, in the *Journal of the American Medical Association* of February 2, 1907, points out that success depends as much on the details as on the generalities. He, therefore, briefly indicates how, under ordinary conditions, he would disinfect a room:

1. The person who disinfects should put on a cap and gown, and the face, at least the mouth and nose, should be covered with a piece of gauze. The cap, gown, and gauze are later left in the room to be disinfected with the other objects.

2. All holes and cracks should be sealed by pasting over them pieces of paper or filling them with cotton or cloth.

3. Precautions under certain circum-

stances: (*a*) If the wall-paper of the room is badly torn in several places, it should be removed; (*b*) if, by accident, a rug or carpet should have remained in the room, it should be thrown over the back of a chair; (*c*) if the room has no door which it is desirable to open, one window should be left unlocked, to be thrown open when the fumigation is complete; (*d*) no vessels containing water should be left in the room.

4. The patient's clothing and the bedclothing should be thrown over the ends of the bed, backs of chairs, or over a wire or rope stretched across the room.

5. Valuable books should be opened and placed on end, so that the leaves may be separated as much as possible.

6. Determine the temperature of the room and see that it is above 60°.

7. See that the room contains enough moisture in a vaporized state.

8. Potassium permanganate is placed in a vessel which has been slightly heated beforehand; to this the formaldehyde is added; 8½ ounces of the potassium permanganate and 20 ounces of the formaldehyde (40-per-cent formaldehyde) to every 1000 cubic feet of room space to be disinfected if penetration of mattresses, etc., is required. If only surface disinfection is desired no more than one-half of these volumes is necessary. If the formaldehyde is generated by a method which liberates all of the gas only 16 ounces are necessary. These volumes are much greater than those given by the manufacturer of most disinfectants. No doubt, also, the volumes given are somewhat greater than absolutely necessary in all instances. Nevertheless, the author thinks that in using disinfectants we ought to employ the same principles as financiers in estimating profits or expenses. They calculate closely just what they will be, and then allow a good margin against themselves for unforeseen circumstances. On account of the variability of strength of many preparations of 40-per-cent formaldehyde, we should be sure that we secure our solution from a reliable house.

9. Let the gas act for six to twelve hours, and open doors or windows. The placing or evaporation of a little ammonia in the room will neutralize the formaldehyde and thus hasten the disappearance of the odor of that substance.

10. All bedding, patient's clothing, etc., that is not harmed by boiling should next be boiled for one-half hour.

11. Wherever possible, the mattress, rugs, etc., should be steamed; the author believes that every large city should have a steam disinfector for this purpose. Where this is not possible, these articles should be taken outdoors and thoroughly aired and beaten. The person beating them should have a piece of gauze tied over his head, and preferably should also wear a suit which may be sterilized by boiling.

12. Paper, rags, cheap books, and other articles of little value should be burned.

13. In case it is not possible to obtain all of the favorable conditions for formaldehyde disinfection, or if there is any suspicion that there are still organisms that need to be killed, all of the woodwork, and if necessary the walls, should be washed with a liquid disinfectant, such as bichloride of mercury, 1:1000; carbolic acid, 5 per cent; or one of the various proprietary coal-tar preparations properly diluted.

SULPHATE OF SPARTEINE IN SURGICAL PRACTICE.

McGUIRE states in the *American Journal of Surgery* for February, 1907, that like most surgeons he devotes little time to the study of the therapeutic action of drugs. Patients who are referred to him have usually exhausted the resources of the materia medica, and in his practice he rarely has occasion to employ medicinal agents other than the well-known anesthetics, antiseptics, purgatives, and tonics. He believes, however, he has accidentally discovered in sulphate of sparteine a valuable remedy for the prevention and treatment of postoperative suppression of urine.

He does not know whether his experience coincides with that of other surgeons, but it is a fact that in the last five years he has lost more cases from postoperative suppression of urine than from all other causes

combined, and this despite the almost routine use of chloroform as an anesthetic.

The cases have usually been those with preëxisting nephritis from sepsis or cholemia. Shock has not apparently been a factor, for the condition would not develop for twenty-four or thirty-six hours. A patient operated upon for retention of urine, or for jaundice due to obstruction of the common duct, would do well for one or two days, and just as he was thought to be out of danger there would come the news that he was passing no urine. He would become restless, then listless, would develop a stupor which would rapidly deepen into coma, and would die with all the symptoms characteristic of uremia. In the treatment of this condition the author tried water by mouth, under the skin, and in the rectum; hot packs and vapor baths; cups and counter-irritants; strychnine, digitalis, and nitroglycerin; calomel and saline purgatives, and in one case stripping the kidney capsules, with uniformly bad results.

Two years ago he began empirically the use of sulphate of sparteine, and now has the record of six cases in which he is sure the drug was the means of saving the patient's life.

The therapeutic effect of sulphate of sparteine is to increase the blood-pressure, make the pulse slower and stronger, and act as a powerful diuretic. Its action is manifest in thirty minutes after administration and lasts for four to six hours.

In the author's belief the reason why the value of sulphate of sparteine is not more widely recognized is because authorities advise its use in doses so small as to be worthless. To get results it must be given hypodermically in doses of from one to two grains, repeated every three to six hours. When so employed he has repeatedly seen it stop a runaway heart and set in motion a pair of stalled kidneys. Its use should not be delayed until suppression of urine is already in existence, but it should be prescribed as a prophylactic as well as a curative agent.

The writer does not mean to claim that it is a specific, or that it should be employed to the exclusion of other measures, such as purgatives. transfusions, and hot packs. He does believe, however, from actual experience, that it is preferable to the drugs of the digitalis type in rapidity of action, ease of administration, and, what is more important, results.

THE CAUSATION AND TREATMENT OF SOME HEADACHES.

In the *Lancet* of February 2, 1907, HARRIS writes on this subject. He reminds us that constipation is an extremely common cause of headache, and though it may accompany migraine and may even determine its onset it is less frequently one of the causes of periodic headache resembling migraine, rather than of toxemic headache, which is more constant, often daily in its occurrence. A very definite type of recurrent toxemic headache, which may easily be mistaken for migraine, is that associated with sluggish liver and habitual constipation. The pain in the head, as in migraine, is extremely severe, prostrating the patient completely for about twenty-four hours, and the tendency to these headaches may run in families, increasing the liability to confusion with migraine; but they differ from this neurosis in the following important particulars: There is no evidence of neuroses in the family; the periodic headaches get worse in middle life instead of better; there is no preliminary visual spectrum, though the patient may complain of a certain amount of dimness of vision; there is the close association of the headaches with constipation, furred tongue, foul breath, sallow skin and conjunctivæ, while the headaches may be warded off by a cholagogue and saline aperients and are not influenced by phenazone, phenacetine, bromides, or the usual headache powders. There is no arteriosclerotic factor in this type of headache, the pulse remaining quite soft, and there is no albuminuria. The sluggish liver action and the constipation are the key to the treatment, yet there is a curious cycle of symptoms. The headache will pass off in about twenty-four hours or so, even

though the bowels be not relieved, and the patient then feels quite bright and clear-headed. After one or two days a slight, dull frontal headache returns, especially in the morning, and after an interval varying in different persons, but often fairly constant for the same individual, the severe headache recurs. This recurrent cycle of symptoms ending in the explosion of headache is apparently due in large part to a functional disturbance of the liver, the periodicity of the symptoms suggesting some derangement of its nervous control.

Toxemic headaches are due to a circulating blood poison, which may be introduced into the blood from without, such as alcohol, lead, iron, or ether, or the poison may be some acute microbic infection, as pneumonia, typhoid fever, influenza, or smallpox, or as the result of some chronic morbid process, as chronic gastritis, chronic Bright's disease, gout, diabetes, or cirrhosis of the liver. Gout and arteriosclerosis are both very common causes of chronic headache, the high arterial tension in the latter being a most important contributory cause. The headache in arteriosclerosis may be most persistent and resistant to ordinary treatment, though it may at once yield to nitroglycerin or one of the other nitrites, through the resulting lowering of blood-pressure. In chronic Bright's disease, especially the contracted granular variety with hard arteries, the headache is equally severe and persistent, in part due to the high blood-pressure, and partly due to a toxemia secondary to the kidney disease. Indeed, there are only two other causes of headache so severe and persistent as that of chronic Bright's disease with arteriosclerosis, namely, cerebral tumor and cerebral syphilis.

The headache associated with gout is not always associated with high arterial tension, but is often due to a toxemia dependent upon a faulty metabolism, and appears to be caused by the circulation in the blood of purins and other uric acid antecedents derived from a diet containing an excess of these bodies. These uric acid antecedents are chiefly derived from an excessive meat diet, though they are also contained in tea and coffee. For persons, especially those of sedentary habits, with large appetites who are complaining of frequent morning headache it will be well in certain cases to insist on a rigid purin-free diet of milk, eggs, cheese, butter, cream, bread, nuts, macaroni, potatoes, and green vegetables. Such patients should drink a small tumblerful of some good laxative saline, taken hot the last thing before going to bed. With a weekly dose of calomel or blue pill and a short walk before breakfast every morning relief may often thus be obtained from the persistent distracting pain at the top and back of the head, which, in men over forty years of age, is frequently the result of long-continued excess of proteid constituents in the diet. It is possible that excess of the other constituents of food besides proteid—namely, the fats and carbohydrates—may, as Francis Hare has suggested, be responsible for a similar process of toxemia, which he has named "hyperpyremia." Thus excess of all forms of food, not only proteid but fats and carbohydrates also, is likely to lead to overloading of the liver, and finally of the excretory organs, the kidneys. The postulate that the large majority of people habitually eat too much may be taken as in a fair way of being proved, since the researches of Chittenden on metabolism and the calorific values of diet, on the lines preached by Fletcher, have shown that the average individual can maintain perfect health and strength, while doing fair muscular work, on a diet the calorific value of which is not more than from one-half to two-thirds of that usually accepted as the irreducible minimum.

Lastly, the effect of an open-air life has scarcely received sufficient prominence in the treatment of many forms of toxemic headache. Persons who are subject to chronic headaches should cultivate the habit of keeping their windows widely open, and the hardening process thus slowly applied will not only render the individual far less susceptible to catching ordinary colds, but his tendency to fre-

quent headaches will often completely disappear, and from a listless valetudinarian with always something wrong with him he will become brisk and healthy in mind and body.

THE TREATMENT OF BALDNESS.

La Tribune Médicale for January, 1907, gives the following recipes (Ewald's treatment) for baldness. At the start apply:

Tincture of cantharides, 4 Cc.;
Balsam of Peru,
White wax, of each 8.0;
Oil of rosemary, 20 drops;
Vaselin, 60.0.

Later, if the baldness persists:

Balsam of Peru,
Tincture of cantharides, of each 10.0;
Oil of jasmine,
Oil of neroli,
Oil of rose,
Oil of bitter almonds, of each 15.0;
Sterilized beef marrow, 50.0.

Brocq's treatment is as follows:

Acetic acid, glacial, 5.0;
Tincture of cantharides, 10.0;
Tincture of rosemary, 25.0;
Tincture of jaborandi, 25.0;
Rum, 150.0.

Mix. Apply to the scalp daily.

Barré uses in baldness in convalescence from various diseases:

Hydrochloric acid, 4.0;
Essence of lemon, 150.0.

Mix. Apply night and morning.

Lassar uses in alopecia:

Naphthol, 50.0;
Alcohol, 100.0.

Wash the scalp with tar soap; then apply the above and wash in Van Swieten's solution.

A prominent dermatologist in New York uses the following formula as a cure for dandruff and incipient baldness; the amount of castor oil should be varied to suit the case, and the mixture should be well shaken before using:

Resorcin, 3j;
Betanaphthol, 3ss;
Chloral hydrate, 3ij;
Tr. cantharides, 3iv;
Tr. capsicum, 3j;
Castor oil, 3ss to 3ij;
Cologne water, 3iv;
Bay rum, enough to make Oj.

The following is taken from some therapeutic notes published in the *New York Medical Journal* of December 15, 1906:

When the baldness is not due to a parasitic cause, such as ringworm or favus, or to a general cause like syphilis, various methods have been recommended. Lassar (*Deutsche medicinische Wochenschrift*, July 5, 1906) applies the following:

℞ Sodii carbonatis,
Potassii carbonatis, āā 15 grammes;
Saponis, 70 grammes;
Aquæ rosæ, 100 grammes.
M.

The scalp is to be shampooed with this preparation and with warm water, and washed with water at ordinary temperature, then dried with a towel. Applications are then made with:

℞ Hydrargyri bichloridi, 0.30 gramme;
Phenolis liquefacti, 6 grammes;
Aquæ destillatæ, 150 grammes.
M. To be applied for half an hour, on a compress.

When the compresses are removed the hair is dried in the air, and the scalp is next rubbed with:

℞ Thymolis, 0.25 gramme;
Alcoholis (90°), 100 grammes:
M.

After this has dried, a small quantity of the following pomade is used:

℞ Acidi salicylici, 1 gramme;
Tincturæ benzoini, 2 grammes;
Olei olivæ, 50 grammes;
Olei bergamottæ, gtt. xv.
M.

The *Revue pratique d'obstétrique et de gynécologie* (Oct. 10, 1906) recommends a similar method of treating baldness: The scalp is to be washed with tar soap, daily, for a period of six or eight weeks; later the application is to be made less frequently. The scalp is to be rubbed for ten minutes, and then the soap-suds are removed by a stream of warm water. Following this the scalp is to be washed with cold water and dried with a towel, and a little of the following is used with friction:

℞ Hydrargyri bichloridi, 0.5 gramme;
Aquæ destillatæ, 150 grammes;
Glycerini,
Spiritus odorati, āā 50 grammes.
M.

THE VALUE OF SODIUM CITRATE IN DYSPEPSIA.

According to Dr. L. LACHENY, writing in *La Semaine Médicale* of November 7, 1906, sodium citrate gives favorable results in the treatment of dyspepsia in adults, especially in cases of gastric pain, occurring three or four hours after a meal, followed by vomiting. He prescribes a 10-per-cent solution of the salt in tablespoonful doses (cuillérees à soupe), to be taken every five minutes from the time when the pain and sickness commence until they cease. The average dose required to give relief is from 30 to 60 grains; occasionally a dose of 15 grains will suffice, while in some cases it is necessary to give as much as 120 grains. In case of a relapse the treatment should be renewed, with the result that the symptoms frequently disappear in a few days. In fourteen cases treated in this manner seven were cured in eight days; one patient, however, was under treatment for three weeks and two others for a month before a satisfactory result was obtained. The other patients were benefited by the treatment; one of these, suffering from ulcer of the stomach, experienced considerable amelioration of the pain from the administration of 45 grains of sodium citrate every day for thirty-seven days.—*Lancet*, Feb. 2, 1907.

SOME COMMON ERRORS IN THE DIET AND GENERAL HYGIENE OF CHILDREN.

VOELCKER in the *British Medical Journal* of January 26, 1907, says that at the risk of a charge of "flogging a dead horse" he urges what we as medical men cannot insist on too strongly—the necessity for mothers to nurse their own infants. The objections which are raised to this are the unwillingness of the mother to be tied down and the necessity for foregoing many social pleasures and duties. Such reasons are unmaternal and should not weigh with us, but we must also remember that in addition to the temptation not to be tied too closely to the nursery there is often very considerable pressure exerted on both mother and doctor by the husband; we should remember this when we are endeavoring to get a mother to do her duty to her offspring. In these cases, instead of directing our arguments to the mother, we would do much better if we boldly attacked the head of the house and pointed out to him how much safer it was for both mother and child if the child were breast-fed. An immense amount of evil is done by monthly nurses by the persistent efforts some of them make to induce the mothers not to suckle their infants. The question may be raised, why is it that this should be the case? Well, there are three reasons set forth: First, it is a popular suggestion with the parents in too many cases; secondly, it saves the nurse, or, as she would say, the mother. trouble. If an infant is breast-fed it has to be brought to its mother every two to three hours, and while it is being fed it has to be waited for, and then put back into its cot, and this we can well imagine is not a popular proceeding with the nurse. In the third place, too often the monthly nurse's ideal is to leave a fat and heavy baby when "her month is up." Smithfield dead meat market is her ideal, and provided the babe puts on weight as long as she is in charge all is well. The author here expresses the wish that there were some way by which those who start mischief through artificial feeding could be made to suffer for the later results of their actions. It is surprising how much wrong feeding some children will put up with, but most of these results of artificial feeding only show themselves some time after the monthly nurse has taken her departure, with the promise of her reëngagement for the next "if it ever should come."

The mention of the increase in weight, which is so commonly urged as a defense of the practice of artificial feeding of infants, reminds the writer of another danger to the happiness of a home into which "number one" has arrived. This danger is the weighing machine. He has called it a danger, not a curse, though it may become the latter. He has known the household, he asserts, to be upset because in a certain

few days baby has not gained any weight. There are times when the weighing of infants may give us most valuable information and guidance in treatment, but there are times when much the best course is to send the scales to be cleaned or to get them broken. As a rule, numbers five, six, seven, and eight in a family are not weighed.

As you probably know, there is a widespread belief that cow's milk and mother's milk do not agree, and that a child cannot be brought up on a combination of feeding from these two sources. This, the author is glad to say, is combated by the advice they at the Hospital for Sick Children, Great Ormond Street, give in the pamphlet which they issue on the bringing up of infants. Here is to be found that they urge if the mother's milk be insufficient, the child should be given cow's milk, suitably diluted, in addition to the breast milk. This heresy that the two do not agree is to be strongly condemned, for it will often be found that, whereas the mother's milk may have been insufficient at first, yet after a short time it suffices as the sole form of nourishment for the child. To speak of the endeavors of some mothers to nurse their children as half-hearted is an abuse of terms. Many of these mothers never mean to be bothered with nursing their children, and will seize on any excuse which enables them to pose as unwilling victims of natural defects.

Before you agree to the discontinuance of breast feeding satisfy yourself that the dilution and preparation of the substitute for breast milk has been properly and fairly tried. It is almost laughable to hear what a number of food preparations are in some cases said to have been tried within a short limit of time, and to have been found wanting. It is often thought that because a preparation is not at once retained by a child it is not suitable. This may be one of the reasons why we hear of so many cases which are said to be unable to take cow's milk. In an experience of nearly eighteen years in a large hospital the author has hardly come across a single case in which cow's milk, when properly modified, could not be retained. It is a common error to assume that cow's milk does not suit a child because the child happens occasionally to reject some of it. This leads the author to mention another error—that it is a good sign for an infant to throw up a little at the end of each feeding. The monthly nurse has this as an *idée fixe,* but it should be regarded either as a proof that the child has had too much, or, what is more often the case, that the child has taken its food too rapidly. Want of attention to this point of the rapidity with which children take their food leads to discredit being attached to the food rather than to the feeder.

ARGYROSIS, INCLUDING A PRELIMINARY NOTE ON THE ACTION OF SILVER SALTS.

The *Ophthalmoscope* for January, 1907, contains a paper by BURDEN-COOPER in which he says that the bluish-white pellicle which follows the application of nitrate to the conjunctiva is not coagulated albumen, as is usually supposed, but chloride of silver deposited in the structure of the membrane, and this leads one to add a remark as to the form of application which is most likely to be followed by staining. The writer's experience is in favor of drops, and the explanation is as follows: A strong solution of silver nitrate (15 grains to the ounce) will be precipitated in the cells to such an extent as wholly to destroy their vitality—they are cast off together with the chloride they contain, and in this way the greater amount of silver chloride is got rid of. Silver nitrate, however, penetrates deeper, but the critical concentration, after the initial precipitation, is insufficient to determine a deposit of chloride in the cells in sufficient quantity to destroy them (weak solution). This chloride undergoes the change above described. It is precisely this incapacity on the part of a weak solution of nitrate of silver to be precipitated in the cells in sufficient quantity to destroy them, combined with the frequency of application, that makes the weak solution most potent in causing a stain.

To recapitulate briefly, then, as far as argyrosis is concerned:

1. The essential element in determining the stain is the soluble chlorides of the tissues.

2. It is chloride of silver that is decomposed by light, not albuminous material.

3. The soluble chlorides influence the rate of penetration of silver nitrate.

4. The depth of penetration is a function of the concentration of the silver solution.

5. The seat of the stain is determined by the soluble chloride, and is also dependent on the strength of the solution.

6. The brown stain is either argentous chloride or an oxychloride of silver.

7. The black stain is either metallic silver or the black oxide, probably the former.

8. Drops are more potent in causing a stain than an application of a stronger solution by the brush.

The author then adds a word upon the organic preparations of silver. From his experiments, which were undertaken with a view to ascertaining their penetrating power, as compared with solution of nitrate of silver, his former faith in them, which was never very great, has now almost ceased to exist. One cannot go into them individually here, in fact the author has not tested them all yet; but one can speak of argyrol and of its ally collargol, which are, perhaps, the most disappointing specimens of the lot. The penetration of a 20-per-cent solution of argyrol as compared with weak nitrate is practically *nil*, and one is not surprised to find this, as the molecules of these organic silver compounds must be large, and if so, must exert a powerful influence on the action of the body they collectively represent. Then again, we know that organically combined silver is very inert as compared with the inorganic form. The amount of silver such bodies contain is no criterion of their therapeutic utility. The all-essential point is, can any of the large amount of silver enter into a reaction whereby it changes its electrical state and stability from that of its initial to that of its final state? If so, then it has some potential energy behind it.

Argyrol does not react with a soluble chloride, and most of the silver is deposited as such on adding a dilute acid. The author believes it is wholly inert in the conjunctival sac, or at any rate almost so. Its intense color is a false expression of its energy. He has read of an experiment which consisted in placing a piece of catgut in a solution of argyrol, and after some hours finding it had percolated through and through. The experiment was to show its intense power of penetration. Untwist a strand of catgut and note the fibers it is composed of, and see how absurd it is to assume great penetrative power on the part of a liquid which finds its way between a few fibers of catgut. The time has come for us to cease playing at therapeutics, and to cast out of our Pharmacopœia a lot of worthless material. Argyrol may have a mechanical effect, no doubt, and its sedative action is due to the large amount of silver it contains (metallic silver is sedative in its action), but when this is said the author believes we have summed up argyrol. It is interesting to note the comparative rarity of staining by argyrol or any other organic silver compound (protargol gives a reaction with a soluble chloride, so he does not include it).

One is gratified to see from the report of the special committee appointed by the British Medical Association to investigate the bactericidal action of the various silver compounds that their results are in accordance with those of the writer of this paper. Approached from an entirely different standpoint, they are led to conclude that the amount of silver a compound may contain is no criterion of its bactericidal power, and the same conclusion the writer would extend to properties other than bactericidal. He is quite aware, judging from the extensive literature on the therapeutic uses of the organic silver salts and the praise that has been accorded them, that his ideas rank with those who are in the minority, but they are based on convictions which,

he trusts, are well grounded, and his remarks are presented with all respect to those who have labored in the same field with more favorable results.

He for one, he asserts, will think twice of casting aside, and replacing with any such material as argyrol or its allies, the time-honored nitrate of silver, which has rendered such signal service in ophthalmology, and which is ever on the alert to enter into some reaction whereby its electrical state and stability of its ions are altered. Herein lies its virtue, as far as he can see.

ATROPHIC RHINITIS.

RICHARDS in the *Journal of the American Medical Association* of January 5, 1907, says that when one turns to the special therapeutic measures which are in use they are found to consist in the main of thorough cleansing of the nasal passages from the attached crusts, and the local employment for the most part of some form of stimulating applications. Cozzolini preferred curetting on the ground that the new stimulated tissue which might form would be less annoying than the old mucous membrane. When the pseudodiphtheria bacillus or the pneumobacillus of Friedlander was thought to be the cause, many observers began using antitoxin, and with alleged good results.

These good results were probably, however, entirely due to the fact that the antitoxins increased the glandular activity, thereby lessening the fetor, and had the drawback that so far as any real cure was concerned, they were useless, very expensive, the dosage being enormously large, and probably harmful; and the author believes that the method of treatment has fallen into disuse.

In the years 1886, 1887, and 1888 there was considerable discussion in the American Laryngological Association with reference to the use of four or five milliamperes of the negative galvanic current applied for five to fifteen minutes directly to the nasal mucous membrane by means of a copper wire and cotton saturated with normal salt solution, and many observers, such as Delavan, Hartman, and others, reported cases as greatly benefited or cured. Time, however, has not proved the value of this remedy, and in a private letter just received from Dr. Hartman he states that he gave up the use of the galvanic current some years ago. Whereas the results in the first instance seemed to be encouraging, in the long run he found it no better than other methods resorted to, most of which, he says, have been disappointing.

In the discussion on the treatment before the American Laryngological Association, Rive thinks as good results are obtained by endeavoring to improve the hygienic conditions as from any other particular thing, and advocates the use of local stimulants and bactericides. He mentions a long list of local applications, such as bichloride of mercury 1:4000 or 1:2000, diphtheria antitoxin, galvanism, the Gottstein tampon, iodoform, iodol, aristol (thymol iodide), salicylic acid, camphor, iodine, perchloride of iron, tannin, alum, rhatany, opium, medicated bougies, stimulating volatile substances, essential oils, cubebs, tar, eucalyptus, thymol, antoinsufflators for carbolic acid, menthol, oil of pine, 20-per-cent pyoktannin in wool-fat, electric vibration, borax in glycerin, chloride of ammonium in glycerin, chloride of potassium and phosphate of sodium, ammonium phosphate, honey and terebene, creosote ointment, cubeb cigarettes, creolin bougies, resorcinol 0.5 per cent in vaselin; these have all had their advocates. Destructive agents, such as the galvanocautery, were used at one time, and they are here mentioned only as a matter of history, as it is presumed no one uses anything of the kind at present. Hydrogen peroxide and preparations containing it seem useful as cleansing agents, but in the long run they leave the mucous membrane as dry as ever. Oily substances, as menstrua for other things, have been very much used, but so far as these are concerned, although they have their advocates, the author feels with Dr. T. R. French that in the treat-

ment of these conditions they are to be avoided, as the oils have no therapeutic value in the nasal mucous membrane, tend to block the orifices of the glands, and although for the time being they contribute to the comfort of the patient, are in reality of very little use. Some years ago the writer first brought the use of formalin to the attention of the profession as a remedy in the treatment of atrophic rhinitis as a deodorant and stimulant, and at first got good results, but has now discontinued its use for several years as it was very annoying to the patient, and although productive of some influence in regard to the fetor, did not seem to materially influence the progress of the disease.

Somers has advocated citric acid as a deodorant, but states that it is of no value otherwise; Ingals reported in 1897 that a quarter of one per cent of yellow oxide of mercury is a good remedy; J. H. Nichols reported 10 per cent orthochlorphenol; John O. Roe advocated a mild solution of nitrate of silver. The author has used nearly all of the proprietary silver salts. Dr. Leland advocated the use of 10- to 20-per-cent cocaine on cotton for twenty minutes, then 1:5000-2000 corrosive for the same length of time to get general congestion. There is no doubt, however, that he has long since abandoned this. Hubbard used cotton tampons put in alcoholic solution of acetanilide. Porcher advocated the use of potassium iodide on cotton tampons. This preparation, known as Lugol's iodine, the author used for many years, and still uses more or less, and finds it one of the most efficient measures. He has used ichthyol in its many combinations, with and without glycerin, and has found this one of the many valuable methods of local application. When all is said and done, the local therapeutics seems to reduce itself to a thorough cleansing of the nasal mucous membrane, and the use of any application which produces a mild stimulation is probably as effective as anything. The severer remedies do not seem to have any material advantage over the milder ones. It is the author's belief that we have no specific, but he hopes that one may yet be found, and that the future will not, as in the past, seem to show more failures than successes.

THE COMPARATIVE EFFICIENCY OF SILVER NITRATE, PROTARGOL, AND ARGYROL.

BUTLER in the *Ophthalmoscope* for January, 1907, reminds us that every summer an epidemic of acute mucopurulent conjunctivitis breaks out in Palestine and Egypt, caused chiefly by the Koch-Weeks bacillus. During this epidemic many hundred cases present themselves at the British Ophthalmic Hospital in Jerusalem. The author has in consequence had ample material to make a comparative examination of the therapeutic effects of silver nitrate, protargol, and argyrol in the treatment of this disease. For many years silver nitrate has been exclusively used at this hospital, and it has given excellent results. Long experience has shown that it cannot be safely used in a stronger solution than three per cent, and a two-per-cent solution has generally been employed. A two-per-cent solution of silver nitrate, even if neither neutralized nor washed out, never causes any irritation, nor do the lids, even in infants, ever show any signs of cauterization. Any solution stronger than three per cent. unless at once neutralized with salt solution, has a caustic action, leaving a faint film of destroyed epithelium. This is especially the case with infants, who form the majority of the cases. Accordingly, in making these tests, a two-per-cent solution of silver nitrate was always employed. In adults the silver solution was neither washed out nor neutralized. In infants the eye was washed out with boric lotion, after the application of the nitrate. Protargol and argyrol were used in a 33-per-cent solution (33 grammes in 100 grammes of water). The solution was freely used and the excess was left in the eye. The solutions were always applied by means of small pellets of absorbent wool held in catch forceps. Drops for home use were always given—silver

nitrate in 0.2-per-cent strength, or argyrol or protargol in five-per-cent solution.

These comparative tests, which were made in the summer of 1905, were carried out as follows: Cases were chosen in which the disease was in an early stage, and the two eyes nearly equally affected. One drug was applied to the right eye, another to the left, while the third was given for home use. The next day the eyes were inspected, and the differential treatment continued day by day until either one drug established a superiority or it was certain that both were having an equal effect. Many of the patients were never seen again; probably the first application cured the case.

Forty-two cases in which silver nitrate was tested against protargol were followed up to a complete cure. The results were as follows:

Protargol superior in 62 per cent of the cases.

Silver nitrate superior in 10 per cent.

Equal result in 24 per cent.

In many of the cases in which protargol proved the better drug the difference was not great, but it was sufficient to demonstrate its superior therapeutic action.

In twenty-two completed cases, protargol was tested against argyrol with the following results:

Protargol proved superior in 50 per cent of the cases.

Argyrol proved superior in 0.45 per cent of the cases.

Even result in 49.55 per cent of the cases.

Or in short, in half the cases the effect of the two drugs was the same, and in half argyrol proved to be inferior in therapeutic action to protargol.

In many of the cases in which protargol gave the best result, the difference in its favor was very pronounced; in some of them the "protargolized" eye recovered after two to three days of treatment, whereas there was still a discharge from the "argyrolized" eye at the end of a week. Some of these eyes at once recovered when protargol was substituted for argyrol. In four cases argyrol seemed to cause great irritation, a symptom which the author has never seen caused by silver nitrate or by protargol. After 22 comparative tests the inferiority of argyrol to protargol had become so marked that the tests were discontinued.

In 13 cases argyrol was tested against silver nitrate. In seven of them the effects were equal, in six argyrol showed a slight superiority.

During the past summer (1906) the author used protargol for several hundred cases of acute mucopurulent conjunctivitis, and the results have, in his opinion, been decidedly better than he obtained with silver nitrate in former years.

His conclusions are that protargol is a more satisfactory agent than either argyrol or silver nitrate for the treatment of acute mucopurulent conjunctivitis, and that argyrol is better than silver nitrate. Protargol is perfectly safe up to 33 per cent, and may probably be used in even stronger solutions. Its application causes much less pain than silver nitrate, but more than argyrol. Silver nitrate in strong solutions is a very dangerous agent. It has unfortunately become the custom in Palestine to use 10-per-cent and even stronger solutions, with most lamentable effects. These results have been obtained in conjunctivitis caused by the Koch-Weeks bacillus, and do not in any way contradict the results obtained by others who have tested the colloid silver salts upon gonorrheal conjunctivitis. There are several cases in the summer epidemic in which the gonococcus is present in large numbers, but they almost invariably lead to the non-ulcerative cases upon investigation.

THE MEDICAL TREATMENT OF THOSE GASTRIC DISORDERS IN WHICH THE HELP OF THE SURGEON IS OFTEN DEMANDED.

The *New York State Journal of Medicine* for January, 1907, contains an article by STOCKTON in which he asserts the evident fact that with a peptic ulcer near but not involving the pylorus, the patient should have most careful attention. He advises rest in bed, a milk diet, the abundant administration of bismuth, possibly

also lime-water, light magnesium carbonate, sodium bicarbonate, and the administration of hot alkaline saline waters, early every morning, to empty the digestive tract. While the author is not thoroughly satisfied as to the importance of external local applications, yet he does not feel prepared to condemn Leube's methods of using hot fomentations. He has never given the treatment thorough trial. It has been begun, carried out for a while, but not strictly according to Leube's directions. Occasionally a poultice gives distinct comfort. On the other hand, ice water is more agreeable to some patients. On the whole, he repeats that he is uncertain as to the benefit to be derived by external applications in this disease.

Of late years he has used the stomach-tube in all necessary cases and without hesitation. A soft, large tube is selected, no unnecessary manipulation is attempted, and only a dexterous person should employ it. As we all know there is the utmost difference in the manner of practicing lavage. When really serious gastrorrhagia occurs, he thinks the best plan is to introduce the stomach-tube, irrigate the stomach rapidly to remove accumulated blood, and then allow to flow in a weak solution of adrenalin. As soon as the hemorrhage has ceased the stomach may be irrigated, and any excess of adrenalin removed. We must remember that this substance must not be used indiscriminately. The author usually mixes about one-half a teaspoonful of the 1:1000 adrenalin solution in a glassful of tepid water, allow this to pass through the tube, to remain for a minute or two, and then to run out. Following this a much weaker solution, perhaps one-half a teaspoonful in a quart of water, is used for the purpose of irrigating the stomach. It is very gratifying to see the hemorrhage promptly controlled by this measure. Recently Ewald has advised ice water or gelatin water used through the stomach-tube. The author thinks it is a safe plan to leave gelatin water in the stomach if the hemorrhage has been controlled by adrenalin.

It seems to him as though we should educate all our patients who suffer from gastric ulcer. They should be taught the possibility of hemorrhage and perforation, and should know what to do under the circumstances. That is to say, they should consent to long-continued treatment for hemorrhage, and should be prepared for immediate operation. This recommendation may seem unnecessary, perhaps a little ridiculous; but it does not seem so to the author. He has seen patients unwilling to undergo proper treatment for hemorrhage, and has had patients stubbornly refuse operation after perforation until it was too late, and septic peritonitis was well under way.

For the relief of shock and the agonizing pain which usually succeed the perforation, the prompt use of morphine hypodermically is advisable. It has, however, this disadvantage: The patient, made comfortable by morphine, is unwilling to believe that he has experienced a perforation; and it is well, in dealing with an ignorant person, to secure his consent to the operation before the pain is relieved. Aside from creating this tactical embarrassment, morphine is invaluable and should be promptly used both in perforation and in hemorrhage, and in the case of the latter should be continued in sufficient amount to produce a calming effect both on body and mind. The stomach should be kept perfectly at rest, alimentation should be rectal, and not too much fluid should be used at any one time until two or three days after the hemorrhage has ceased. More than once the author has observed a recurrence of an alarming hemorrhage following the unnecessary introduction of large normal saline enemata given with a view of restoring the force of the circulation. Severe gastrorrhagia can be successfully controlled by irrigation with adrenalin and gelatin water as described above, together with complete rest in bed, morphine hypodermically, and careful rectal alimentation. Where the hemorrhage recurs in spite of these methods, it is wiser to resort to surgery without further delay. The author thinks this point is one on which we

should have further evidence before we can be perfectly sure of our course. Operation at this late hour, he is informed, is not altogether satisfactory. On the other hand, an early operation for hemorrhage has not given as good results as was expected. As matters stand one feels like using medical measures, and the stomach-tube carefully but thoroughly, and if these fail, then have immediate recourse to surgical aid.

THE TREATMENT OF CHRONIC BRONCHITIS OF OLD PEOPLE.

STOCKTON states in the *New York State Journal of Medicine* for January, 1907, that the chronic bronchitis of senility, accompanied not infrequently by an unhealthy state of the mucous membrane of the upper air-passages, is dependent in part upon vascular degeneration and disturbed blood supply; but also to a very considerable extent upon a toxemia, which is almost universally present in old people.

One finds in the aged incompetent kidneys, imperfect digestion, incomplete emptying of the colon, lessened activity of the glandular secretions in the digestive tract; also one finds that the skin is harsh, dry, or sodden, lacking in elasticity and in the natural activity of its glands, showing in fact a poor blood supply and also the effects of intoxication. In the lungs one expects to find a degree of emphysema, comparatively fixed chest walls, and therefore imperfect respiratory movements, all contributing to a lessened oxygen intake. One will usually find in addition that the heart is strained to propel a lessened quantity of poorly oxygenated and overviscid blood through narrow vessels. These facts, without further enumeration of details, may suffice to show that the respiratory function is overtaxed in the aged, that the resistance is lowered and infection made easy. Chronic bronchitis increases in the winter largely for the reason that delicate old people seek the warmth and confinement of the poorly ventilated house. Really the best method of treatment is hygienic and consists in systemic elimination, while increasing the resisting power of the individual. A practical way of carrying out this method of treatment is to prescribe from two to three times a week a hot-air cabinet bath, to be followed by sponging in salt water (not immersion in the tub); the regular irrigation of the colon that the patient may escape the disadvantage of the absorption of toxic material, which so easily occurs in old people, and upon the importance of which Professor Metchnikoff has justly insisted. Then the patients should sit in rooms thoroughly ventilated, with windows open even in winter. If too cold, furs may be worn, but pure air is absolutely requisite.

The writer has had the pleasure of seeing, with scarcely an exception, improvement in all cases of chronic bronchitis in the aged subjected to this treatment—in many complete relief—although it will be seen that the treatment must be repeated year after year. Not only is the cough relieved, but the energy, usefulness, and happiness of the patient are all equally advanced. It is occasionally necessary to advise the drinking of tar water or the use of small doses of potassium iodide. Cough mixtures are particularly forbidden. The principles involved in this method are not limited in application to old people.

NOTE ON THE THERAPEUTICS AND PROPHYLAXIS OF INFLUENZA BY QUININE.

BROADBENT in the *Practitioner* for January, 1907, tells us that from the time of the first invasion of influenza he has found that the best remedy was quinine. His usual prescription is one drachm of ammoniated quinine and two drachms of liquor ammoniæ acetatis every hour for three hours, and then every four hours. In the fulminating attacks of influenza, in which the patient has become comatose, hydrobromate of quinine, given hypodermically in large doses, has completely relieved the unconsciousness.

As a prophylactic he early orders two grains of quinine every morning during the prevalence of the epidemic, and the results

appear to be good. Of course, patients who are taking quinine do occasionally get influenza, but he has known very many instances in which this dose has made a complete difference in the patient's liability to infection, and even in the general mode of life.

The author has, moreover, had opportunities of obtaining extraordinary evidence of its protective power. In a large public school it was ordered to be taken every morning. Some of the boys in the school were home boarders, and it was found that while the boarders at the school took the quinine in the presence of a master every morning there were scarcely any cases of influenza among them, although the home boarders suffered nearly as much as before.

In a large girls' school near London the same thing was ordered, and the girls and mistresses took their morning dose, but the servants were forgotten. The result was that scarcely any girl or mistress suffered, while the servants were all down with influenza.

THE RESPIRATORY COMPLICATIONS OF INFLUENZA.

In speaking of the treatment of these complications of influenza MacKenzie in the *Practitioner* for January, 1907, states that as we have no specific remedy, treatment has to be based on symptoms, and the first symptom of importance is the cough. A great many remedies have been tried, and we cannot say that any remedy is specially efficacious. Where the cough is dry and paroxysmal, heroin hydrochloride in doses of from 1/36 to 1/12 of a grain may be given at intervals of from one to two hours. Barley water, linseed tea, toast and water, or warm milk may be sipped occasionally. The following linctus has been found to be efficacious where the cough is frequent and severe:

℞ Morphinæ hydrochlor., gr. ½;
Apomorphinæ hydrochlor., gr. ¼;
Acid. hydrochlor. dil., min. xx;
Syr. prun. virginianæ, f ℥ss;
Aquæ, q. s. ad f ℥ij.

Ft. linct. Sig.: One drachm occasionally.

When there is bronchitis, a mixture containing citrate of ammonia, citrate of potash, and ipecacuanha wine is useful:

℞ Liquor. ammon. citratis, ℥jss;
Potassii citratis, gr. xv;
Vini ipecac., min. v;
Aquæ, q. s. ad ℥j.

Take as one dose.

Another mixture which is useful is a formula in use at the Brompton Hospital. This is:

℞ Sodii bicarb., gr. xv;
Sodii chloridi, gr. v;
Spirit. chloroform., min. v;
Aquæ anisi, f ℥j.

Take in one dose.

When the secretion is thick and viscid, and expectorated with difficulty, preparations containing opium are contraindicated, and should not be given. Linseed or linseed and mustard poultices or turpentine stupes sometimes give much relief, when there is tightness and soreness of the chest.

The same remedies may be given in cases of pneumonia. Here the main indication is to maintain the patient's strength. The chief danger is cardiac failure, and when there are signs of failing heart, stimulants should be cautiously administered. Digitalis, strophanthus, caffeine, and strychnine are all useful drugs.

Huchard recommends 30 to 50 minims per diem of a solution of digitalis (1 in 1000). Finkler advises the use of camphor in heart failure, camphorated oil being given subcutaneously.

Oxygen inhalations will relieve when there is marked dyspnea. Alcohol is indicated when there is prostration and failing heart, and champagne and brandy are specially valuable. The amounts to be given must be regulated by the effects on the heart and pulse in individual cases.

The diet should consist mainly of milk, eggs, beef tea, chicken broth, rusks, arrowroot, Benger's food, and calf's-foot jelly. The hygiene of the mouth and teeth should be particularly attended to. The bowels should be acted on if necessary.

Fresh air is the best prophylactic against influenza. It is also a sovereign remedy in the treatment of both the acute and chronic manifestations of the disease in the respira-

tory tract. Nothing is more striking than the way in which influenza spreads in the stuffy and ill-ventilated hotels, in which people have usually to live who travel in search of health. Out of many hotels in a well-known health resort, the writer knows of one only in which the visitors escaped influenza during several winters, and that was a hotel in which, thanks to the presence of a doctor, who knew the value of fresh air, the windows in the public rooms and lounges were kept constantly open. How long it will be before the general public in this country will come to recognize that open windows are health-giving, instead of being dangerous, one cannot tell. The people who have been brought up with the idea that the slightest breath of air which comes into a house from outside may give them a chill are not likely to change their views for all our assurances that they are mistaken. These are the people who insist on closed windows in trains and hotels, and in all places of public resort, and it is through their mistaken prejudice that influenza spreads as it does. But this is by the way. What the author wants to insist on is the advantage which accrues to the influenza patient if he is treated rationally and sensibly, and if the air of the sick-room is rendered wholesome by free opening of windows.

Many doctors still cling to the old ideas that bronchitis, bronchopneumonia, and pneumonia must be treated in a warm room, and that it is dangerous to allow the temperature of the room to get below 62° F.

But purity of the air which the patient gets to breathe is of far greater importance than its temperature. In fact, up to a certain point the cooler the air is the more invigorating and refreshing it is, and it is senseless to deny to the patient fresh air from outside, and allow him a draught of cold oxygen from a cylinder.

Open-air treatment is the best restorative in chronic influenzal respiratory affections, and the author is quite as much impressed by the results obtained therefrom in these troubles as in chronic pulmonary tuberculosis.

The author suggests some hotel or sanatorium, run on open-air lines, for the reception of non-tuberculous patients convalescing from influenza, or from some other acute illness. It would supply a felt want, and would do much to promote the rapid and complete recovery of its visitors.

THE DANGEROUS ACTION OF MERCURY ON THE KIDNEY.

It is probable that certain instances of nephritis met with in cases of long standing syphilis are less the consequence of the latter than of the treatment ordinarily employed. Clinically, at least, this appears evident, as is proved by many syphilitics, who have undergone an intense and prolonged mercurial treatment, presenting renal lesions of greater intensity than those of syphilitics who have employed mercury with more discretion. The intensive treatment without doubt has its decided indications, but when once the accidents which it was intended to control have disappeared, great precaution is necessary, and it may be questioned whether mercury, no longer finding any spirochætæ in the organism, does not at this time bring its action to bear on the cells themselves. According to the *Journal des Praticiens* of October 27, 1906, Fournier and Balzer are inclined to this opinion. However, the difficulty is to know when the specific organism of the disease has disappeared.

There are two dangers surrounding the treatment of syphilis, namely, giving too much mercury and giving too little, and a careful observation of the case alone allows one to avoid them. It is quite certain that the kidneys are exposed to great danger by the absorption of mercury, and the lesions set up from this drug are more frequent than is generally believed. Acute nephritis, due to mercurial poisoning, has been described, but less importance has been attached to interstitial transformations, and these, quite evident from a microscopical standpoint, are no less so from the experimental side. Progressive in development, these lesions have no other origin than the

absorption of mercury. Clinically, the same may be said.

In the chronic types of nephritis it is difficult to elucidate the action of mercury on the evolution of the process. There certainly exists a syphilitic nephritis in both the secondary and the tertiary period, demonstrated by the presence of albumin in the urine. Now, secondary and tertiary syphilitic albuminuria are generally influenced favorably by a mercurial treatment, and in its turn the latter is quite capable of producing albuminuria; therefore it is not easy to decide whether syphilis or mercury is the factor. There are several symptoms, however, which generally enable one to form an opinion. Syphilitic albuminuria may be accompanied by other manifestations of the pathological process, and if these are wanting the action of the treatment will demonstrate its nature.

Urinary disturbances are usually bettered by mercury when the drug is given with prudence. In point of fact, there are very acute cases in which the renal epithelium has undergone a very general degeneration, and there no longer exists enough sufficiently normal tissue to assure both the elimination of the syphilitic toxins and that of the mercury. Consequently the medicament should be administered with precaution, observing the effects produced, and if the patient improves its use should be continued. On the contrary, if during a mercurial treatment the albuminuria increases, and especially if a large number of casts are eliminated and the albuminuria increases in intensity, treatment should be suspended. It is quite true that competent authorities have pointed out that mercurial albuminuria is slight in amount, a fact which distinguishes it from the albuminuria of syphilitic nephritis; and still more, mercurial albuminuria is preceded by polyuria. All this is quite true, but not infrequently any precision in diagnosis from such indications is lacking. We do not refer to the condition of the gums, which is not sufficient, and the only proper way is a daily analysis of the urine in order to be sure of one's ground.

So far as tertiary nephritis is concerned, we must be more reserved. Frequently the renal lesion, which is attributed to syphilis, is of an entirely different nature and merely indicates involvement of the kidney, due to premature senility the result of syphilis. To give mercury under these circumstances is to expose oneself to disasters, and all the phenomena of renal insufficiency will arise, dyspnea being the first to show itself. The use of mercury should be suspended at once, and theobromine, with a milk and vegetable diet deprived of salt, should be prescribed. Huchard has particularly insisted upon this point.—*New York Medical Journal,* Dec. 29, 1906.

POISONOUS PLUGS IN INFANTS' FEEDING BOTTLES.

Mr. F. A. Pond contributes an interesting communication to the *Lancet* of December 22, 1906, in which he ascribes the lead poisoning of certain infants who came under his care to the presence of lead in the rubber plug of the feeding bottle. In three cases the most marked symptom was evidently, he says, abdominal pain causing a deal of straining, drawing up of the legs, and crying. The fourth case was one of profuse diarrhea with offensive odor, the temperature was 102° F., the pulse was thready and rapid, and there was very early collapse, resulting in death a few days after the child was seen. A sign noticed in all cases was a narrow, bluish, punctated line on the edge of the gum of the lower jaw. All the babies were being fed from the same pattern feeding-bottle fitted with a pure rubber teat and a dull, black-colored plug or valve. The cavity in one of the plugs was filled with malodorous decomposed clotted cream, and had evidently been used in this foul condition for days. The baby using this plug was the one that died. The others recovered after the removal of the plugs. The lines remained on the gums for weeks.

Mr. Pond found that these black rubber plugs were made with lead. One of the plugs which Mr. Pond kindly sent was sub-

mitted to analysis, with the result that it was found to contain no less than 5.77 per cent of lead with 1.16 per cent of copper. The plug weighed just under 50 grains, so that the actual quantity of lead present estimated as metal was 2.88 grains, and of copper, also estimated as metal, 0.58 grain. The plugs in the feeding bottles were very sticky, adhering to everything they touched, and blackening the fingers. It is, therefore, easily conceivable that the lead would contaminate the milk and be imbibed by the child. Dirty conditions apart, which alone may quickly render milk septic and thus account for the onset of diarrhea of the kind described, the use of lead and copper compounds in any part of a feeding apparatus is highly reprehensible.—*Lancet,* Dec. 22, 1906.

DIGITALIS PREPARATIONS.

It is an old experience that digitalis leaves are very variable in their activity. Withering, who did so much to encourage the use of this remedy, insisted that the leaves should be gathered only at the time of the plant's blossoming, not in moist weather, and should be dried carefully at not too high a temperature and kept in a dry place. Further observations have shown that wild plants alone are valuable, and that those which grow in sunny spots contain more active principle than those which grow in the shade; and Focke, in a most thorough investigation (*Therapie der Gegenwart,* 1902, p. 44), showed that there were regular variations in therapeutic efficiency in the leaves during the time of their development, leaves gathered early in the year being only one-fourth as active as those gathered late in the summer. The importance of many of these and other significant facts was not lost to the revisers of the last edition of the United States Pharmacopœia, and the progressive druggist should know the essential features of leaves which come up to the standard.

One feature of this study has been somewhat neglected, and in view of the wide use of dry preparations (tablets, etc.) of digitalis, a research of E. Wang (*Festkrift tillegnad Olof Hammarsten,* Upsala Läkareforenings Förhandlingen, xi) is of immediate practical interest. He sought to determine what changes took place as the leaves themselves after gathering grew older, for which purpose extracts made from the leaves gathered from the years 1884 to 1906 were carefully tested on frogs, and the activity of the glucosides determined.

Focke's contention that if good leaves were carefully dried and powdered and kept in dry and sealed containers they lost very little of their efficiency, was confirmed by the author's researches, but he found that leaves which were kept in the ordinary manner rapidly deteriorated. Thus, those gathered in 1903 had lost one-half of their strength as contrasted with those gathered in 1905. Inasmuch as the leaves of digitalis are highly hygroscopic, enzymes that break down the glucosides act very readily on those exposed to the air and its moisture. It is not at all improbable that many tablet triturates of digitalis, which are notoriously untrustworthy, deteriorate by reason of precisely the same enzyme reduction.—*New York Medical Journal,* Dec. 29, 1906.

THE DIETETIC TREATMENT OF DIABETES MELLITUS.

MAX EINHORN in the *Journal of the American Medical Association* of December 29, 1906, writes on this subject, and after discussing various points in diet asserts that an absolute meat and fat diet can be borne for only a short period. Such a diet should, however, be about as follows:

Strict Diet.—8 A.M., two eggs, butter, tea; 11 A.M., ham, wine; 1 P.M., beef tea, 200 grammes of meat or fish, one egg, lettuce or spinach; 4 P.M., coffee, two eggs and butter; 7 P.M., three eggs fried in lard, or fish with eggs or cold roast.

A trace of sugar is contained even in this diet, but it hardly amounts to over one per cent. By the addition of some milk and cream this diet may be made a little more agreeable, although the quantity of sugar is greater.

Such a diet may be put together about as follows:

Intermediate Diet. — Breakfast: 200 grammes of milk with 50 grammes of cream, two eggs, butter, and 100 grammes of roast. Dinner: 200 grammes of meat or fish with asparagus or peas, salads; 4 P.M., 200 grammes of milk with 50 grammes of cream. Supper: Four scrambled eggs with 120 grammes of ham.

C. von Noorden determines first how much carbohydrate a patient can assimilate, and allows about half of this. Such a procedure appears very rational, but can be conducted only in special clinics and not in general practice. It is best to arrange the diet according to customary principles, varying it slightly to fit the individual requirements of the patients. Whether or not a diet agrees with the patient can best be determined by noting the diminution of the quantity of sugar, as well as the total daily quantity of urine, and secondly and mainly by the patient feeling better and stronger.

According to the experience of most clinicians, it is best to permit diabetics a certain, although limited, amount of carbohydrates.

Seegen's diet list for diabetics is probably the best known, and therefore the writer quotes it in full:

These solids are allowed in any quantity: Meat of every kind, smoked meat, ham, tongue, fish of every kind, oysters, mussels, crabs, lobsters, meat jellies, aspic, eggs, caviar, cream, butter, cheese, and bacon. Of vegetables: Spinach, lettuce, endive, Brussels sprouts, pickles, fresh asparagus, watercress, sorrel, artichokes, mushrooms, nuts.

Allowed in moderate quantity: Cauliflower, carrots, turnips, cabbage, green beans, berries, such as strawberries, raspberries, currants, also oranges and almonds.

Forbidden absolutely: All foods made from flour or meal; bread is allowed in moderate quantities, according to the physician's orders; sweet potatoes, rice, tapioca, arrowroot, sago, grits, vegetables, green peas, cabbage, sweet fruits, especially grapes, cherries, peaches, apricots, plums, and dried fruit of every sort.

Beverages.—Allowed in any quantity: Water, soda water, tea, and coffee. Of wines, Bordeaux, Rhine wine, Moselle, Austrian and Hungarian table wines—in a word, all wines that are not sweet and that do not contain more than the average amount of alcohol.

Allowed in moderate quantity: Milk, butter, beer, unsweetened almond milk, lemonade, without sugar.

Forbidden: Champagne, sweet beer, cider, fruit wine, sweet lemonade, liquors, fruit juices, water-ices, sorbets, cocoa, and chocolate.

In general, the author uses about the same diet as Seegen, and gives the following:

	Calories.
Breakfast:	
Three eggs	240
Half a roll (20 grammes)	50
Butter (30 grammes)	251
Coffee (150 grammes), milk (100 grammes), cream (50 grammes)	203
Dinner:	
A plate of soup (200 grammes), with egg	85
Meat (200 grammes)	200
Half a roll and butter (15 grammes)	175
Asparagus with butter sauce (salad)	30
Supper:	
Oysters or fish (100 grammes)	100
Three scrambled eggs with butter (15 grammes)	365
Half a roll with butter (15 grammes)	175
Westphalian ham (50 grammes)	200
Apples, tea and cream (50 grammes)	138
	2212

Various diet cures have proved of value in diabetes. Of these the best known are the "milk cure" of Winternitz, the "potato cure" of Mossé, and the "oatmeal cure" of von Noorden.

Whereas Mossé's potato cure has not proved of much value, the other two cures are useful in suitable cases. They should not be extended over too long a time because a too limited diet is harmful if continued too long. Winternitz's milk cure consists in the patient exclusively taking milk (about four quarts daily).

Von Noorden recommends his oatmeal

cure, especially in grave cases of diabetes. He uses either Knorr's oatmeal or Hohenlohe's oatmeal flakes. This substance is boiled in water for a long time with a little salt; while boiling butter and a vegetable albuminoid, or, after cooling, the beaten white of eggs, are added. Roborants may be employed for this purpose with good advantage. The daily quantity is 250 grammes of oatmeal, 100 grammes of albumin, and 300 grammes of butter. The soup prepared in this manner is given every two hours. Cognac or wine or black coffee may also be permitted.

No matter what form of diet is instituted, it is always essential to see that the quantity of food is sufficient. In this respect fat (butter, cream, oil, lard) is of more importance here than in other conditions. Alcohol, taken moderately in the shape of whisky, cognac, or wine, is also of value. The body receives in the first place more fuel (as 50 grammes of alcohol, which may be put down as the daily quantity, contains about 350 calories); and secondly, because the patient, with the addition of wine, can take more of the greasy food than without it.

SCHLOSSER'S TREATMENT FOR TRIGEMINAL NEURALGIA.

KILIANI in the *Medical Record* of December 29, 1906, describes, in short, the technique of this plan of treatment. To make sure that one really injects into the nerve affected with neuralgia, Schlösser injects into the foramen through which the respective branch emerges into the face, namely, for the first branch the foramen supraorbital, for the second the infraorbital, and for the third the dental inferior. For this purpose Schlösser has devised for his syringe a set of needles of such thick tubing that the edge does not cut at the point of the needle. In that way no arteries, or even veins, are injured by the injection, incredible as it may seem. This point is of special importance, if the injection has to be made into the ganglion of Gasser, in case all three branches are affected. It is impossible to describe the technique exactly, at least in a short paper. It must suffice to say that, in case of an injection into the supraorbital foramen, the needle, being pushed sagittally along the sometimes not very well-defined foramen, must not penetrate the periosteum of the orbit; otherwise the alcohol injected would produce a very pronounced and possibly dangerous retrobulbar edema.

The injection into the second branch is really the easiest, and does not involve any danger.

The injection into the third branch presents the most difficulties—at least, it has given the author the most trouble. The use of the curved needle devised for the third branch has been given up by Schlösser to a great extent, for reasons which one can appreciate, as it is extremely difficult to feel around the corner, so to speak, in an operation where everything is dependent on the sense of touch.

A successful injection into the inferior dental foramen invariably produces a more or less pronounced tetaniform spasm of the pterygoid and masseter muscles, a mild form of lockjaw, which may last from several days to several weeks. As it is only partial, the patients, who are more or less accustomed to this state of affairs, are quite willing to put up with the condition, if warned beforehand.

To inject into the foramen ovale the following procedure is used: The longest of the three straight needles is pushed through the cheek of the afflicted side about opposite the last molar, the index-finger of the left hand is inserted into the mouth as a guide behind the last molar, and the needle then shoved under the periosteum upward along the external pterygoid plate until it is arrested, which takes up about 2¼ inches of the needle. If the handle of the needle, so to speak, is still further lowered, another quarter of an inch can be gained in pushing the needle still further upward toward the base of the skull, when it is definitely arrested. If we feel our way then backward, scraping along the bone for about three-eighths of an inch, we feel how the needle enters the foramen ovale, where

the injection takes place. It would lead a little too far if the author were to try to explain how the foramen rotundum is reached without injury to the neighboring parts; but it can be safely done.

One understands at once that the technique is a peculiar one, and has to be acquired, as far as possible, on the cadaver, although one is surprised at the difficulties one meets after apparently mastering the technique on the cadaver.

But the technical difficulties, great as they are, are not the only ones. The principal thing is the clinical experience which enables us to judge which branch to treat, one or several, or when to attack the ganglion. This is one of the reasons why Schlösser so far has not described his method in detail, because he feels that if it is to become the common property of surgeons and physicians, the minutest rules will have to be given to meet all purposes. This he is doing now by writing a treatise, which will be published soon, and of which he has asked the author to prepare an English edition.

The injection is done without narcosis: first because it is really not overpainful, and secondly because one needs the help of the patient in determining whether a small test injection produces a tingling sensation along the course of the nerve.

The result of a successful injection is at once apparent; for a minute or two there is a sharp, burning pain, similar to a mild attack, to which the patients, who are accustomed to such suffering, do not much object. After an hour or so there is sometimes quite severe pain for one or two hours, interrupted by typical attacks. Three to four hours after injection, at the very most, the patients are surprisingly comfortable. In one of the author's cases the patient, who had attacks every two minutes, and who needed a day and night orderly to prevent him from committing suicide, was after the first successful injection free from pain for the first time in years, and slept all night without the administration of any drug, while previously all known sedatives and anodynes, given in dangerously large doses, had proved of no avail. This first injection is usually followed after twenty-four hours by a second one, if the edema is not in the way; a third one the next day; and, if necessary, a fourth one a few days later. Then these patients are cured until the recurrence sets in. This takes place after ten to twelve to fourteen months. Then the attacks are much lighter, and yield to one or two injections.

This brings us to another point: we know that all treatments, even including gasserectomy, are liable not to prevent recurrence; that treatment is the best which permits repetition.

The injection, if executed by a specially trained and skilful surgeon, guided by experience, is without danger, and in its effect is little short of marvelous.

ICE-WATER ENEMATA IN THE TREATMENT OF SUNSTROKE.

In the *Journal of the Royal Army Medical Corps* for December Captain M. F. Foulds, R.A.M.C., has called attention to a little known treatment for sunstroke suggested to him by Captain W. A. Heppolette, Indian Subordinate Medical Department—namely, iced-water enemata. In Jhansí, India, in 1903 he saw his first cases of sunstroke, which were all of the same type. The thermometer ranged from 105° to 115° F. in the shade. Nine men were taken into hospital unconscious and with deep and stertorous breathing, dry, burning skin, rapid pulse, and a temperature of from 107° to 110°. They were stripped and put to bed in the shade. One attendant poured water over them, as cold as could be obtained, and two others rubbed the body with ice. An enema of about a quart of iced water was given every ten minutes until the axillary temperature fell to 102°. The back of the neck was blistered. All the patients recovered, and Captain Foulds thinks that they owed their lives to the use of the enemata. Six other men were taken into hospital drowsy and complaining of pains in the head and dizziness and with temperatures varying from

103° to 105°—*i.e.*, with all the prodromata of sunstroke. They were treated with iced-water enemata and left the hospital quite well on the following morning.

Captain Foulds advocates this treatment of sunstroke on the grounds that when a person is hot and wants to cool himself he takes an iced drink. The patient suffering from sunstroke is generally unconscious or nearly so, and it is much easier and safer to administer iced enemata than to wash out the stomach with iced water. Professor Osler advises packing the patient in a bath of ice, and says that iced-water enemata may also be administered. Sir Patrick Manson advocates only external application of cold. Captain Foulds points out that in India ice is not issued in such quantity as to enable every patient suffering from sunstroke to be packed with ice, and that it takes very little ice to cool a quart enema.

The statistics of sunstroke in India show a high mortality. In 1900, 174 patients suffering from sunstroke were admitted into hospital, of whom 40 died; in 1901, 157 were admitted and 37 died; in 1902, 171 were admitted and 16 died; and in 1903, 307 were admitted and 54 died. When these results are compared with those of Captain Foulds, his claim that if the treatment advocated by him were better known the mortality of sunstroke would be diminished seems to be reasonable. He also makes the suggestion that the treatment might prove useful in hyperpyrexia, such as occurs in rheumatic and scarlet fever and tetanus.—*Lancet,* Dec. 22, 1906.

INFANTILE DIARRHEA, WITH SPECIAL REFERENCE TO THE USE OF "LACTATED MILK."

In the *Clinical Journal* of December 19, 1906, BATTEN says that the preparation of lactated milk is a matter of no great difficulty, but requires a good deal of care and attention to detail. He describes what he has found to be the simplest, easiest, and most successful means, and then mentions some of the difficulties and failures.

Fresh milk is obtained. This is boiled in a saucepan or, what the author has found most convenient for a small quantity, a "Gourmet milk sterilizer" in order to sterilize it. The boiled milk is now decanted into a sterilized bottle and the stopper closed. The milk is then stood in cold water until the temperature has fallen to 96° F. To every 11 ounces of milk one tube (about 3 drachms) of the fluid "lactobaccilline" (lactone tablets in U. S.) is then added, and in order to mix it with the milk the bottle is well shaken. The bottle is stood in a water-bath or incubator at the temperature of 96° F. for seven hours; during this time the milk becomes sour, and a clot more or less firm is formed in the milk. At the end of this period the milk is like a feebly-set junket. The bottle is now removed from the bath and is placed in the ice chest, and here it remains for twelve hours; during this period the clot undergoes some solution, and at the end of the period a creamy fluid is obtained which is sour in taste but is quite agreeable to drink, and most children will take it readily when diluted with water and a small quantity of sugar added. According to the preparers of the "lactobaccilline" this dissolution of the clot should not take place, and the milk which is prepared by them remains in a solid condition, but can be broken up with a spoon and can be drunk out of a tumbler.

The writer has thought it not improbable that the liquefaction of the clot formed was due to the action of a "liquefying" lactic acid bacillus which had a low optimum temperature (see Conn, "Bacteria in Milk and its Products," page 71).

Whatever was the cause of the liquefaction of the clot it did not impair the efficiency or taste of the milk, and it occurred with such regularity that the author was of the opinion that it must be due to something contained in the liquid "lactobaccilline."

He has had failures in the preparation of the milk; on one occasion the milk became bitter, due apparently to butyric fermentation, and on another gas was formed from the presence of yeast. On another the milk would not clot. He has endeavored

to carry on the process of lactic acid fermentation from one specimen of prepared milk to another. This is not attended with success, chiefly because it is impossible to completely sterilize the milk in the first instance by boiling, and during the process of lactic acid fermentation the spores of other organisms become developed, and develop actively in the second milk inoculated.

The question will rightly be asked, What is the organism which gives rise to the formation of lactic acid in milk? There are numerous organisms of different types which have the power of producing lactic acid in milk; some of these are harmless, others are pathogenic. In the preparation of "lactobaccilline" two organisms are present: (1) a long rod bacillus growing in chains, Gram-staining, and known as the bacillus acidi lactici, Bulgarian variety; (2) a short rod, or streptococcus acidi lactici, European variety.

The first is the most active in formation of lactic acid, but if allowed to act alone gives rise to a too acid taste to the milk.

INTESTINAL PERFORATION BY FOREIGN BODIES.

MENNACHER (*Münchener medicinische Wochenschrift,* No. 52, 1906) reports a duodenal perforation by a hairpin which was too long to pass the angle made by the junction of the descending and ascending portions of the gut.

The patient, a girl six years old, had swallowed a hairpin 3½ inches long four months before, and although it had not been seen in the stools the parents thought it must have come away, and had almost forgotten it.

The symptoms of perforation were ushered in by sudden severe cutting abdominal pain and recurrent vomiting, abdominal rigidity, and tenderness. Respiration was costal and rapid, pulse 133, temperature 101° F.

The attack resembled appendicitis, but a radiogram showed the hairpin lying points upward at the lower border of the second lumbar vertebra. Operation was deferred because the pulse, respiration, and temperature fell to normal and the pain ceased, the child sleeping well all night. On the day following, however, the symptoms of a progressive peritonitis were obvious. On operation the blunt end of the hairpin was found to have perforated, most of the foreign body lying without the bowel. Death, incident to the purulent peritonitis, followed in a few hours. It was demonstrated at the autopsy and by a study of other bodies that a body as long as the hairpin could not pass the duodenal angle without tearing the mesentery. The author notes that a remission of the symptoms about twelve hours after intestinal perforation is quite common.

PUERPERAL INFECTION INCREASED BY ANTISEPTIC DOUCHES.

Comparison of labor cases which were given a douche of one quart of 1 to 1000 bichloride immediately before labor with cases not so treated convinced BAISCH (*Archiv für Gynäkologie,* Band 79, Heft 2, 1906) that the antiseptic did harm.

Of the cases treated with the douche 12.8 per cent had puerperal fever as compared to 8 per cent of those not treated. Bacteriologic study of the lochia showed a much greater number of streptococci in the douched cases, while the harmless bacteria were much diminished. The author concludes that antiseptic douches increase the liability to septic infection.

THYROID GLAND—SUCCESSFUL TRANSPLANTATION.

The failure of previous attempts to transplant this organ is ascribed by CRISTIANI and KUMMER (*Münchener medicinische Wochenschrift,* No. 49, 1906) to the large size of the pieces transplanted. They found that if very small pieces of normal thyroid of the same species were implanted immediately after removal they would take root and in some cases show marked physiological hypertrophy. In twenty-six cases in man the operation was completely successful, and in one case pieces of the gland excised after three years showed a marked increase in normal thyroid tissue.

LESIONS OF THE BRAIN—EXPLORATORY PUNCTURE.

In cases of brain lesions which appear to be localized, but whose exact location and nature are uncertain, ASCOLI (*Berliner klinische Wochenschrift,* No. 51, 1906) explores the suspected parts with a hypodermic needle mounted on a large syringe and inserted through a hole bored in the skull by a dental engine carrying a fine drill.

The skull over the suspected part is exposed by a small incision, and a small drill is applied at right angles to the skull. Great care must be exercised to stop the motor the instant resistance ceases as the dura must not be injured. As soon as the bone is penetrated, the handle is removed from the drill, which is left in position as a guide. Great care is necessary when the drill is removed, as the least slipping of the soft parts may conceal the hole, which owing to its small size is difficult to find. The drill having been withdrawn and replaced by the needle of the syringe, this is pushed carefully forward, the piston being drawn back slowly until liquid appears. If the puncture is negative another is made at the next suspicious spot, and this may be repeated as often as desired, no harm being done if the meningeal vessels are avoided. In this way abscesses, cysts, hemorrhages, necrotic tumors, tuberculosis, and even gliomata may be located, the nature of the mass being determined by microscopic study. The depth to which the needle may be pushed depends on the case, but ordinarily it is not wise to push it beyond a depth which could be reached by operation if the mass were of a nature demanding removal. This operation has the advantage over the exploration by removal of a skull flap that it is less harmful and covers more ground.

DRAINAGE AFTER ABDOMINAL OPERATIONS.

Threads of catgut are used as drains by HANS (*Centralblatt für Chirurgie,* No. 47, 1906), who claims that they have sufficient osmotic power without requiring a large opening in the abdominal wall with its danger of hernia.

Drainage is most often required in operations which leave a stump the end of which is ligated and therefore liable to gangrene. In such cases he ligates the stump with silk and sews the peritoneum over it with chromicized catgut, one or more strands of which are left long and drawn out through the abdominal incision, which is entirely closed. These threads serve as drains as long as necessary, and then can be withdrawn as the inner end is absorbed and they are freed. If it is necessary to reopen the abdomen the thread serves as a guide to the source of trouble. The same method can of course be used in operations requiring drainage in other parts of the body.

CHRONIC HYDROCELE—DIAGNOSIS OF TUBERCULAR.

On the study of fifty-eight cases WIJNHAUSEN (*Centralblatt für Chirurgie,* No. 52, 1906) bases conclusions regarding the microscopic characters of the aspirated fluid. He finds in ordinary hydrocele very few lymphocytes and only a small number of endothelial or other cells. If many cells, and especially many lymphocytes, are found in the fluid the disease is almost certainly tubercular. The therapeutic indications from these findings are comparatively clear.

FRONTAL SINUS EMPYEMA—INTRANASAL OPERATION.

On looking at a longitudinal section of the skull just alongside the nasal septum, one sees that the anterior part of the nasal cavity is separated from the frontal sinus which lies directly above it by a wedge-shaped mass of bone, the base of which passes into the nasal bone. This mass consists of the crest of the nasal bone and the expanded part of the base of the nasal spine of the frontal bone. It is this wedge-shaped projection which HALLE (*Berliner klinische Wochenschrift,* No. 43, 1906) proposes to remove in its entirety.

For this purpose he uses a series of burrs driven by a dental engine and prevented from going too far back and injuring the

brain by a corresponding series of curved groove directors. A probe is first inserted in the nasofrontal duct, and a director is passed in along the probe, which is then withdrawn. The convex surface of the director is backward, guarding the floor of the brain. A straight burr with a cutting end is then driven into the nasal sinus along the groove, cutting into the base of the nasal spine. The field of operation must be kept in view at all times to guard against the burr slipping off the director. As soon as the opening is large enough the sharp burr is removed and replaced by one dull on the end, which can be safely used until the opening is quite large, and which should then be replaced by a pear-shaped burr which cuts only with its proximal half. In this way there is no danger of injuring the internal table. The same method may be used to clean out the ethmoidal cells. It is necessary to have an assistant press his finger deep into the orbit in order to control the burr when it approaches the orbital wall. The external operation is indicated if the nasofrontal duct cannot be sounded or if the internal operation does not give complete relief, as diseased bone can be removed more thoroughly by the external route.

BRAIN TUMORS—PALLIATIVE OPERATION.

In case of brain tumor so large or so situated that it cannot be removed by operation SAENGER, following the teaching of Cushing (*Centralblatt für Chirurgie,* No. 47, 1906), recommends the removal of a portion of the skull-cap to relieve pressure.

The trephining should be performed as close as possible to the growth, or when this cannot be located, over the right parietal lobe, as this is the safest place. The indication for operation is beginning choked disk, as not much benefit is to be expected in advanced cases. The defect in the skull is best covered with a flap of muscle when possible. Of nineteen cases operated on in this way sixteen showed great improvement, two were not benefited, and one died immediately after the operation. The benefits of the operation are seen especially in relief of pain and in regression of the optic nerve atrophy.

CARCINOMA—ARTIFICIAL IMMUNITY.

A series of experiments on mice are reported by SCHOENE (*Münchener medicinische Wochenschrift,* No. 61, 1906), who has determined the influence on implanted tumors of extracts of various organs and tissues administered beforehand.

He found that mice injected several times with a suspension of mouse embryos of any age were very resistant to the carcinomas, as were mice injected with human cancer cells. The suspension of chick embryos and of mouse liver and testicle had no protective influence.

TUBERCULOSIS OF THE SEMINAL VESICLES—TREATMENT.

The indications for removal of the seminal vesicles are considered by BAUDET and KENDIRJY (*Revue de Chirurgie,* Nos. 9 to 12, 1906).

The condition is always associated with disease of the testicles and vas deferens, although its severity bears no relation to the extent of these lesions and both vesicles may be involved in one-sided orchitis. The symptoms are not striking as a rule. There is usually vesical tenesmus, and there may be rectal tenesmus and pain at stool. Examination reveals an obliteration of the groove normally felt between these organs and the prostate gland. Occasionally there is a fistula leading to the perineum. The prostate is enlarged in about one-third of the cases.

Treatment may not be necessary in early cases, the lesion healing spontaneously after castration. If, however, there is a fistula or extreme difficulty at stool, or if the organ is as large as the last joint of the thumb, it should be removed, unless there is tubercular disease of the bladder or kidney, which may be looked upon as contraindications. The operation of choice is perineal by a Y-shaped incision, the shaft of the Y pointing forward in the middle

line and the arms embracing the front of the anus. The technique of this and of all other operations which have been proposed for the removal of the vesicles is given in detail.

ANESTHETIZATION FOR OPERATIONS ON THE URINARY ORGANS.

MORTIMER (*West London Medical Journal,* January, 1907) states that there are probably no operations, even those involving the air-passages, in which the skill of the anesthetist is more severely tested than in cases of prostatectomy, and he is quite fixed in his mind that ether alone is an unstable agent for producing anesthesia. The A. C. E. mixture is the one of his preference. He states that the trouble for which the anesthetist must be particularly on the alert occurs at an early stage when the bladder has been distended, and before the actual removal of the prostate. This distention causes shallow, hesitating breathing, with prolongation of expiration, accompanied in bad cases by disturbance of the pulse, and even by failure of both pulse and respiration. These symptoms are relieved by a prompt opening of the bladder. A case is recorded from the practice of another anesthetist in which pulse and respiration ceased as the result of vesical distention, but resumed when this viscus was opened.

The author notes that he has had two similar experiences. He holds that the process of enucleation acts as a powerful respiratory and circulatory stimulant, the effect of which is at once noted in the deepened breathing and fuller pulse. If, however, the patient is in poor condition, or the enucleation prolonged, it is probable that these favorable signs will not appear, or will be replaced by those of depression and shock. An especial difficulty is that incident to rigid contraction of the recti and levatores ani muscles, which may be set up in conjunction with the contraction of the bladder, or immediately the surgeon begins to enucleate. This the author states may extend to the muscles of the lower jaw, tongue, and larynx, and must be regarded as peculiar to the operation, occurring in spite of the patients being fully under the anesthetic and persisting sometimes even when this is pushed to a dangerous degree.

In kidney operations the author apparently regards ether as objectionable not so much because of its irritating effect on the kidneys, as from the fact that when patients are in the lateral position, even when an arm-rest is used, the chest movements are more hampered than in the supine position and consequently accumulation of mucus is likely to occur. Mortimer notes as a complication of renal operations that when the kidney is pushed from the front there often results a gush of fluid from the stomach, accompanied by little if any retching.

TREATMENT OF UREMIA.

RUSSELL (*West London Medical Journal,* January, 1907) advances strong arguments in favor of the proposition that the cerebral manifestations of uremia are dependent upon cerebral anemia produced by an increase in intracerebral tension resulting from cerebral edema. He cites the excellent effects which have been reported as the result of lumbar puncture practiced for the relief of uremia. The promptitude with which the improvement has occurred after such a procedure has been such as to leave no doubt in the minds of observers that the relation was one of cause and effect. It is also noteworthy that in most of the cases the cerebrospinal fluid escaped under considerable pressure, though McVail states that in neither of his cases was this the case, the fluid merely dropping away. Russell believes that lumbar puncture should be performed in cases of uremia in which coma, convulsions, or really severe headaches are the dominant features, and that the presence of a high blood-pressure would be helpful as indicating the advisability of this procedure. He has no explanation to offer for the material improvement that sometimes undoubtedly follows venesection, since this by lowering the blood-pressure would act in opposition to the compensatory mechan-

ism which maintains the cerebral circulation in the presence of the high intracranial tension, and so should be a harmful rather than a beneficial procedure. It is possible, however, that the benefit which sometimes follows its employment is due to the relief of the failing heart with right-sided distention.

HYPERPLASTIC TUBERCULOUS PERICOLITIS.

KIDD (*Lancet*, Jan. 5, 1907) contributes a study of a peculiar form of tuberculosis involving segments of the intestinal tube and characterized by thickening of the submucous, muscular, and subserous coats of the bowel, without exhibiting either tubercles or caseation. Superficially it resembles a true neoplasm. The seat of election is the ileocecal region, though it may be found in any part of the large bowel, especially in the sigmoid flexure, in the rectum, and occasionally in the ileum. The mesenteric glands which drain the area of affected gut may undergo a similar change or may exhibit the usual picture of gland tuberculosis. In the rectum it has been mistaken for tertiary syphilitic thickening. A similar hyperplastic tuberculosis is observed in other tissues, such as the larynx, pleura, and lymph nodes. To the naked eye there are two types, the submucous and the subserous. The latter can be distinguished at once from neoplasm. The submucous may, however, closely simulate tumor. The submucous type markedly diminishes the lumen of the gut, producing partial stricture, which may be multiple and aggravated by the presence of polypi. Ulcerations of the mucosa may or may not be present. Polypi, which may be single or multiple, are a frequent complication. The submucosa is much thickened, presents a peculiar bluish or whitish-gray, translucent appearance, and resembles cartilage in hardness and translucency. It is distinctly harder and more translucent than the submucous thickening seen in malignant ulceration. The muscular coat is thickened even beyond the stricture, so that there would appear to be true hyperplasia of the muscle elements stimulated by the mild bacterial poison. This layer stands out sharply owing to its brown coloration. The subserous coat is immensely thickened and consists of translucent bluish or gray fibrous tissue of extreme hardness surrounding yellow areas of highly developed fatty tissue, which pass insensibly into one another. These do not in the faintest degree resemble patches of fatty degeneration or caseation, though the latter are sometimes seen as tubercles, rarely however. The serous coat, though slightly thickened, exhibits a smooth surface and is not adherent to surrounding structures. The whole mass is extremely vascular, free capillary bleeding taking place on section. The new vessels are mostly capillaries and are masked by the increase in the fat, so that the general color of the tumor from the outside is yellow. Secondary infection may lead to acute suppuration and gangrene.

The subserous type exhibits little, if any, submucous thickening, the infiltration lying entirely in the subserous coat, thus differing entirely from carcinoma. The condition differs from ordinary tuberculosis in the fact that there is often no ulceration, or if this be present, it is irregular, covers a large area of gut, and is not multiple, nor is it confined to the distribution of the lymph follicles. The fibrous polypi if present are characteristic. Miliary tubercles are seldom seen and caseation is rare. Most cases have occurred during middle life. Cases under twenty are rare. Any disease which lowers the general resistance of the organ, or an occupation which necessitates repeated pressure on the abdominal walls, predisposes to this affection. The proof that the tubercle bacillus is the exciting cause is based on the fact that these organisms have been found in the tissues in large numbers. In some cases some part of the tumor has shown ordinary caseous and giant-cell tuberculosis, while another part has shown the hyperplastic appearances. Portions of the growth injected into guinea-pigs have led to tuberculosis. In the majority of cases there has been found an old chronic tuberculous

focus in the lungs. Advanced tuberculosis of the lungs has in these cases usually been absent, such a condition being associated with multiple tuberculous ulceration of the lymph follicles of the gut.

The theory of the development of this particular form of inflammation is that the gut becomes infected with an attenuated form of the tubercle bacillus, usually by means of swallowed sputum from a small healing cavity in the lung. The patient is fairly resistant to the tubercle bacillus, as shown by the state of lung lesion. The gut becomes infected at some spot where the feces tend to stagnate, as in the cecum or sigmoid flexure. The patient being resistant and the bacillus weak, hyperplasia occurs rather than necrosis.

The author has proven by experiment on animals that tubercle bacilli can make their way into the connective tissue spaces and lymphatics of the gut without a breach in the epithelium. The microscopic picture is sufficiently characteristic for the diagnosis to be framed even though tubercle bacilli cannot be demonstrated. The symptoms sometimes are entirely latent, sometimes simulate an appendicitis with local persistent exudation; at other times there are symptoms of chronic intestinal obstruction with acute exacerbations, with or without palpable tumor. The diagnosis is then apt to be made of malignant disease of the colon. Or there may be obscure symptoms of colic, with a sudden attack of purulent peritonitis, localized or diffuse. The stools may contain mucus or even blood, but usually do not do so. The tumor itself may simulate carcinoma, sarcoma, actinomycosis, excessive exudate caused by appendicitis, and a fecal tumor. In carcinoma the distinction is made by the very slow development of the symptoms and the absence of blood and mucus in the stools. Marked tuberculous family history and the presence of tubercle elsewhere might be suggestive.

The treatment is excision, the diagnosis being made not only by macroscopic appearance but by microscopic examination.

REMOVAL OF THE GALL-BLADDER.

BLAND-SUTTON (*Lancet*, Jan. 5, 1907) considers the gall-bladder with its cystic duct as a diverticulum from the main bile-duct. He calls attention to the tendency of the gall-bladder when enlarged to drag upon the hepatic tissue, developing a tongue-like projection from the liver. He states that a study of the operation returns of the general hospitals in London shows that cholecystotomy has a mortality of about 20 per cent, and is further associated with the inconvenience of fistulæ, which may be biliary, indicating that the surgeon did not clear the main duct of concretions; which may be mucous, due to an impacted calculus in the cystic duct overlooked at the operation; or may be purulent, as a consequence of the sutures used to secure the gall-bladder to the parietal wound acting as setons. Then there is the probability that the gall-bladder may manufacture more calculi, but this is not common.

Bland-Sutton states that he has been particularly troubled in his operations by the difficulty incident to removal of stones from the cystic duct, having lost two cases, whilst in the removal of stones from the common duct he has had no trouble. Now when he finds a stone tightly impacted in the cystic duct he removes the gall-bladder and cystic duct with the impacted stone. Indeed, extirpation of the gall-bladder seems to be his routine procedure in all cases of cholecystitis. He places beneath the person's back a sand-bag 16 inches in circumference and 24 inches long; this lies at about the level of the liver. The abdomen is opened by a vertical incision through the right rectus muscle near its outer border. This may be continued upward parallel with the border of the ribs, and downward if needful. The gall-bladder is then examined, and the bile-ducts are traced out with the finger to ascertain their freedom from obstruction. The field of operation is then shut off with sterilized gauze dabs, and the folds of peritoneum which bind the gall-bladder to the liver are divided on each side with scissors or scalpel, thus enabling the sur-

geon to enucleate the gall-bladder from its bed and follow it toward the portal fissure, where it narrows to the cystic duct. This duct is carefully examined, and any impacted stone is gently squeezed into the gall-bladder, or if a calculus is tightly impacted it is left in the duct, and this structure is seized with forceps beyond the calculus—*i.e.*, near the main duct. The only vessel of importance is the cystic branch of the gastroduodenalis. The method of dealing with the neck of the gall-bladder which the author prefers consists in detaching this structure from the liver and dividing its neck near the cystic duct and leaving the duct without a ligature. Any vessel that bleeds freely is ligated or squeezed. This method is particularly indicated when the enlarged bladder contains pus or is acutely inflamed. A wide drain is inserted. In the course of ten or twelve days the bile ceases to flow along the tube and the wound quickly heals. The surgeon has no trouble with a suppurating fistula, and the patient is spared the tedium of daily dressings and watching for the appearance of a ligature. The statistical study of the operative returns from the chief general hospitals in London shows that during this period cholecystotomy was performed on 105 patients, of whom 16 died. Cholecystectomy was performed on 51 patients, of whom 9 died. Cases in which operations were performed for cancer of the gall-bladder were excluded, since Bland-Sutton holds that these should form a separate group.

ABORTION CAUSED BY X-RAYS.

In a short article LENGFELLNER (*Münchener medicinische Wochenschrift,* No. 44, 1906) cites experiments on guinea-pigs, which fully confirm those of Tellner, showing that even short exposure of the abdomen to the action of the rays is able to destroy the life of a fetus even shortly before term. Alterations were found in the ovaries suggesting sterility. The cause of the fetal death could not be determined macroscopically.

STRICTURE OF THE LARYNX—GRADUAL DILATATION.

The use of rubber tubes which remain in place constantly and exercise pressure on the inside of the larynx and trachea is praised by MARTIN and SARGNON (*Revue de Chirurgie,* No. 8, 1906), who state, however, that they can only be used safely if the patient is in good enough general condition to resist the added danger of inhalation pneumonia, and if time is not of moment. If necessary the point of stricture may be incised before the tube is inserted. In most cases preliminary tracheotomy is performed, and a tracheotomy tube is worn as long as the rubber tube is in place. The tube is introduced from above, stretched lengthwise on a catheter, and as the catheter is withdrawn it is held in place by pressure and by a thread tied around the neck. It is changed every two to four days. The only disadvantage of the method is that it takes from six to nine months to effect a cure.

HEMOPHILIA—PATHOGENESIS AND TREATMENT.

A comparative study of the blood in hereditary and spontaneous hemophilia is reported by WEIL (*Presse Médicale,* No. 87, 1906). He found that the blood in sporadic cases was thin and flowed too freely as well as too long. Clotting was very slow, but the clot once formed was of normal hardness and contracted well. The addition of calcium chloride hastened the process somewhat. The addition of a small amount of normal blood serum made the process entirely normal. The blood of cases of hereditary hemophilia, on the other hand, was found to be thick and viscid and it flowed slowly from a wound. The clotting was even slower than in the other condition, and the clot was not firm and adherent, but flocculent. The addition of calcium chloride hastened the process a little, but had no influence on the character of the clot. The addition of normal serum hastened the process also, but had no other influence on the character of the clot. The addition of such blood to normal blood delays markedly its

coagulation and renders the clot soft and friable. Intravenous injection of normal blood serum cured sporadic cases entirely, and caused some improvement in the hereditary form. These experiments show that sporadic hemophilia is due to the absence from the blood of some normal ferment or similar body, while hereditary hemophilia is due to the presence in the blood of some unknown substance which interferes with coagulation.

SOME OBSERVATIONS ON PARALYSES OF THE BRACHIAL PLEXUS.

WARRINGTON and JONES (*Lancet*, Dec. 15, 1906) state that palsies of the upper extremity due to a lesion of the peripheral nervous system, excepting the named branches of distribution, are classed as paralyses of the brachial plexus. Excluding the invasion of the roots by diseases of the meninges and vertebral column and pressure by new growths or aneurism, the common causes are: (1) Indirect violence, known when it occurs in adults as Erb's or Klumpke's palsy, or if at birth as Duchenne's palsy; (2) rarer cases of neuritis.

Bruns of 22 cases notes that only six recovered. Four of these in adults had paralysis of the upper part and one of the lower part of the plexus, all due to indirect violence. The remaining case of recovery was a severe one of paralysis from pressure during anesthesia. Of seven instances of birth palsy none recovered.

The authors state that they have had under observation 30 cases, of which 11 completely recovered. The nearer the lesion is to the spinal cord the worse the prognosis, though recovery may occur when the anterior spinal roots are damaged, providing that they are not actually severed. The damage is usually found before the nerves enter into the formation of the plexus proper, hence the forms of paralysis are usually radicular in origin.

In regard to symptomatology, pupilary paralysis results from an intravertebral lesion; paralysis of the rhomboid, serratus magnus, or levator anguli scapulæ indicates a lesion internal to the extravertebral portion, situated in either the intra- or intervertebral portion; paralysis of the supra- and infraspinatus muscles indicates a lesion before the formation of the plexus proper. The white rami for the sympathetic, stimulation of which causes dilatation of the pupil and enlargement of the palpebral fissure, are derived from the first, second, and third dorsal anterior roots, and especially from the second. Hence, though damage to the first root causes characteristic oculo-pupilary signs they may not be permanent. If the pupil fails to dilate when a solution of cocaine is instilled into the eye, it is probable that the lesion affects the second as well as the first root.

The authors note that birth palsy of any severity less commonly results in good recovery than the corresponding conditions in adults, and that cases due to a local neuritis are a good deal more favorable than when injury is the cause. The lesion is in general a severe one caused by laceration, tearing, or tension of nerve tissue, simple pressure being less common. They also observe that the presence of the full reaction of degeneration is compatible with complete recovery, and that if spontaneous recovery happens some signs of it are visible in seven months in adult palsy, but that in birth palsy signs of recovery may be delayed for a longer period, but are complete within a year. Partial recoveries are frequent in birth palsy, leaving the residual paralysis to be treated surgically.

The authors believe that mechanical treatment should be thoroughly persevered in before having recourse to operation. Mechanical treatment consists in keeping the overstretched muscles completely relaxed, and this must be continued without intermission for some months. The object of this treatment is to antagonize the functioning muscles and to prevent the degeneration of muscular tissue which rapidly occurs when it becomes elongated by posture. Upon this relaxation of elongated muscles the authors place very great stress, and instance two cases of infantile paralysis, in both of which the muscles of the upper arm and shoulder had been paralyzed for over

two years, while those governing the hand acted normally. A diamond-shaped flap of skin was removed from the bend of the elbow sufficiently long to fix this joint in acute flexion. In this position the hand could be utilized. In less than six months after operation it was noticed that power began to return to the flexors of the elbow, and in less than twelve months the restoration was complete. In neither case was there any recovery in the muscles of the shoulder-girdle. Therefore when the flexors of the forearm are paralyzed in the ordinary upper-arm type the wrist should be drawn toward the neck by a sling in order to keep the flexors of the elbow relaxed. If the extensors of the wrist are paralyzed the joint should be kept hyperextended in order to completely relax the extensors and stretch the flexors, thus aiding the restoration of muscular balance. Moreover, the muscles should be systematically and energetically massaged. The elbow should not be bandaged with a splint excepting over the tendons, since the pressure over the muscles is distinctly harmful. Operation may be advised if no improvement is noted after seven or eight months. As to operation on the nerves, success has followed after almost every method of junction. End-to-end union is the ideal method. Nerve transplantation, anastomosis, and nerve crossing may all be needful at times.

THE CAUSE OF COMMON BALDNESS.

PARKER (*Medical Record*, Feb. 9, 1907) includes under the title of common baldness all cases in which the hair shedding occurs independently of any other disease, and in addition is limited in its field of operation to the portion of scalp occupying the top of the head. The author holds that the cause of common baldness is the absence of upper chest breathing. This results in residual air and the development of a soluble poison which when present in the blood exerts a disturbing effect upon hair growth. The author has experimentally determined that when expired air from human beings is kept chambered in the presence of warmth and moisture long enough for decomposition to take place, there is produced a substance which when introduced into the blood of certain animals exerts a selective poisonous action upon the hair, or tissues analogous to hair, with which such animals may be endowed, and that beyond this, so far as careful observation can determine, it produces no effect whatever.

In his article are graphically pictured pigeons which after three and a half months of treatment have lost their feathers. The substance which is developed by the residual air in the lungs is called by Parker trichotoxin, which he states is not a ptomaine, nor does it produce any effect when given by the mouth. It was isolated by evaporating water which had been supersaturated by air expired from the lungs.

As practical deductions from this ingenious reasoning and experimentation of the author, he states that for a period of ten years successive groups of persons have been treated for common baldness by means of directions to practice continuously upper chest breathing. Results were satisfactory in direct proportion to the thoroughness with which the treatment was applied. When the latter was followed closely for one week, dandruff, when present, entirely disappeared and the hair assumed a natural appearance. In five or six weeks from this time new hair began to make its appearance. This new growth as a rule appeared first among the hairs about the margins of the bald areas, and after multiplying there invaded the bald patches by extension. The new growth, even after being well started, developed slowly, so that months or even years passed before a moderate sized patch of uncovered scalp became covered with new hair.

THE INTERLUDE OF CANCER.

Under this title BEARD (*Medical Record*, Feb. 2, 1907), after a most interesting discussion of cellular life and cancer research, states that the proper scientific treatment of cancer is by the enzyme, and particularly by the pancreatic one. If trypsin alone be

used bad symptoms very soon arise, all of which recall the vomiting of pregnancy and eclampsia. Tryspin alone is a very deadly remedy for cancer, because in killing the cancer albumin this enzyme does not split it up into harmless simple products. Preparations must be potent extracts scientifically prepared from the fresh gland direct. The trypsin injections must contain all the enzymes and be especially rich in trypsin and amylopsin. The injection of amylopsin is to be used at all times to meet and remove bad symptoms, and in the later periods of treatment, when all the cancer albumin has been destroyed, it must be an extract of the pancreas gland free from trypsin.

This treatment is powerless against benign tumors which are composed of real or somatic tissues and not killed or broken up by trypsin.

IRRIGATION AND DRAINAGE OF THE SEMINAL DUCT AND VESICLE THROUGH THE VAS DEFERENS.

BELFIELD (*Proceedings of Association of Genito-Urinary Surgeons,* 1906) has proposed an exceedingly ingenious and thoroughly practical procedure for the treatment of affections which have hitherto been regarded as beyond therapeutic help, excepting such as is conveyed by massage and indirect medication. He states that the vas deferens can easily be brought by the fingers against the skin of the scrotum and held there by a half-curved needle passed through the skin under the vas. A half-inch incision through the skin and envelope of the spermatic cord—painless under local anesthesia—exposes the vas. A transverse or longitudinal incision into the vas opens its canal. The blunted needle of a hypodermic syringe can be passed into this minute canal and a watery solution of any desired agent injected; this liquid traverses the vas and the ampulla, and distends the seminal vesicle.

This operation, and its utility in the treatment of gonorrheal and other pus infections of the seminal vesicle, were presented in the *Journal of the American Medical Association,* April, 1905. Further experience has improved the procedure and widened its scope. When deemed necessary, the vas is stitched to the skin by a fine silkworm-gut suture which passes through the lumen of the canal at each cut surface. Thus a fistula is maintained so long as desired; and through this fistula the vas and vesicle may be injected daily. Moreover, the vas serves as a drainage-tube for the ampulla, which drainage may be facilitated by passing a fine silkworm or horsehair thread along the vas to the ampulla, where it is left until removed for the next injection.

By this procedure direct, repeated, and successful medication of the vas, ampulla, and seminal vesicle is for the first time made possible, and without a serious operation. He usually performs the operation in his office, often unassisted, the patient walking away at its conclusion and losing no time from his vocation.

Irrigation and drainage of the seminal duct and vesicle he has found to be invaluable in the treatment of the following conditions:

1. Chronic gonorrheal infections of the seminal canal (vesiculitis), with or without a gleety discharge.

2. Chronic pus infections of the seminal canal in the middle-aged and elderly (usually mistaken for enlarged prostate).

3. Recurrent epididymitis, which results from repeated invasion of the epididymis by an infection persistent in the seminal vesicle or deep urethra.

4. Acute gonorrheal spermatocystitis; in this condition, and in other severe infections, incision into the vesicle from the rectum with the galvanocautery is sometimes desirable for the immediate relief of severe symptoms. Liquids injected into the vas then escape into the rectum.

In two cases of acute gonorrhea which presented the symptoms usually preceding extension to the epididymis, including pain and tenderness in the inguinal canal, the vas was opened and injected with argyrol solution. No epididymitis occurred; but further experience must determine the possibility

of averting gonorrheal epididymitis by this simple procedure.

In one case of tuberculosis of epididymis, vesicle, and prostate, the vas and vesicle were irrigated with carbolic acid solution—after Rovsing's method for vesical tuberculosis—without appreciable benefit.

The first injection into the vesicle should not exceed 30 minims; a larger amount may cause painful contractions of the vesicle—spermatic colic—and retention of urine, both of which effects Belfield witnessed in his early work. As the inflammatory swelling subsides, the subsequent injections may be carefully increased in quantity.

When complete division of the vas has been deemed wise, end-to-end anastomosis is easily made, after freshening the cut surfaces in old cases, by running a fine catgut or silkworm suture through the lumen of each cut end. That the catgut is absorbed he has witnessed in dogs; if silkworm-gut be used, the ends may be brought through the skin and tied loosely outside, and removed at the end of a week or more. In either case the lumen of the vas is maintained during healing. The fistula made for treatment is closed in the same way.

The infections of the seminal vesicle and vas constitute a neglected field; for the symptoms caused by spermatocystitis—pyuria, frequent and painful urination, even complete retention of urine—are generally referred to the bladder and the prostate, and treated as cystitis and prostatitis. If the subject be above forty years of age—and spermatocystitis is common after that period—he is charged with harboring an enlarged prostate and advised to submit to prostatectomy. These are the cases that were temporarily benefited by resection of the vas deferens, when that operation was popular.

By his method these very important because very common ailments are made amenable to treatment without danger to the patient or to his sexual function. It is well known that even complete occlusion of both seminal canals, as by double gonorrheal epididymitis, does not impair sexual desire or capacity, though preventing the passage of spermatozoa into the urethra; and Belfield's operation does not even occlude the vas.

The suppurating seminal vesicle has been exposed and drained through an extensive perineal incision similar to that for perineal prostatectomy. This operation, first practiced by Dittel and recently modified by Fuller, is severe and bloody, entailing risks and requiring weeks of confinement; it seems justified, if at all, only in cases of perivesiculitis. The method Belfield has devised, with or without a cautery incision from the rectum, suffices for the treatment of the vesicle, as well as the ampulla and vas.

FRACTURES OF THE METATARSUS—INDIRECT.

The importance of these fractures is largely owing to the frequency with which they are not recognized, and KIRCHNER (*Schmidt's Jahrbücher der gesammten Medicin,* Heft 8, 1906) gives in detail the signs as seen in all reported cases.

Only heavy and heavily laden persons are liable to this injury, which occurs when the foot slips from a loose stone or into a rut at the moment the heel is raised, and the weight of the body is suddenly transferred from the great toe to the smaller metatarsal bones, any of which may yield under the strain. The line of fracture is variable, but transverse is more common than oblique. There may be considerable displacement, or almost none, and either of the fragments may be dorsal. The pain is ordinarily so mild that the person continues to walk, thinking that it is due to a slight sprain. The pain frequently increases slowly, so that a physician is consulted several days after the accident, if not at once. In some cases no treatment is thought necessary.

Examination of the injured foot shows a swelling on the dorsum, but generally none on the sole. There is extravasated blood in the skin, and this is of great diagnostic importance. Localized tenderness is almost constant, but crepitation and mobility are rare. The tenderness, in association with a diffuse spindle- or ring-shaped swelling around the bone, felt on the dorsum

of the foot, is enough to confirm the diagnosis. The *x*-ray will show the fracture if it is transverse, but not if oblique, as the neighboring bones interfere with taking the picture from the proper direction. If there is displacement, or after callus has formed, the *x*-ray is almost diagnostic, and it also serves to distinguish possible tubercular disease. The prognosis is very good. Even without treatment union usually results, and the use of the foot is not affected. The time required for bony union is very variable, occurring in from nine to fifty-six days, the average being about twenty-five. This variation depends on individual factors rather than on the form of the break or the method of treatment, which is the same as that of fractures by direct violence.

SURGERY OF THE CHEST.

The following questions are considered in detail by MAYER (*Annales de la Société Royale des Sciences Médicales et Naturelles de Bruxelles,* vol. xv, No. 2): (1) What method will best prevent pneumothorax? (2) How much of the lungs may be removed without dyspnea following? (3) Is there any respiration by the pleural surface?

Three methods have been proposed for avoiding pneumothorax: (1) Suture of the lung to the chest wall to prevent its retraction; (2) insufflation of air under heavy pressure into the lungs; and (3) equalizing intrapulmonary and intrapleural pressure so that the lung loses its tendency to collapse.

The dyspnea which follows pneumothorax is not due to loss of the respiratory surface of one lung, as it is not so great when the lung is excised. It was formerly taught that more blood passed through the collapsed lung than through the expanded one, but this idea has been disproved. The dyspnea is probably due to interference with the action of the heart, perhaps from irritation of the vagus, which causes very similar symptoms. Other dangers of pneumothorax are the strain on the right heart, the loss of heat from evaporation, and the increased danger of infection of the pleura.

Of the three methods proposed to avoid the dangers, that by insufflation should be abandoned, for the following reason: The pressure in the lung is high at the wrong time, so that the blood is not drawn into the lung at the proper moment for oxygenation. The forced pressure often causes emphysema or hemorrhages. The pneumothorax persists after the operation. The danger of infection is not avoided.

Suture of the lung to the chest wall may leave permanent adhesions, and it interferes with the operation, as the attachment is not easily altered after being fixed. For these reasons the method by equalizing pressure is preferable.

The lung does not collapse if there is a difference of 10 to 12 millimeters of mercury between the intrapleural and intrapulmonary pressures. Two methods have been proposed to effect this: the first, the apparatus of Sauerbruch, consists of an air-tight room large enough to accommodate the bodies of the patient and the surgeon. A hole in one end permits the patient's head to protrude, and a rubber ring closes the opening around the neck. The anesthetist is outside the cabinet, and after the patient has been arranged and the surgeons have entered, the door is closed tight and an exhaust pump connected with the interior is started. As soon as the pressure in the cabinet is 10 millimeters lower than that outside the pleural sac may be freely opened without danger of the lung collapsing. The advantage of this method is the fact that it approaches normal conditions of pressure, the intrapulmonary pressure not being increased. Its disadvantages are the cumbrousness and expense of the cabinet and the difficulty of communication between the operator and the anesthetist. To most persons the low pressure is not disagreeable, but occasionally it causes headache and even vertigo in the surgeon.

The second apparatus, which bears the name of Brauer, is much simpler. It consists of a mask which contains the patient's head and the hands of the anesthetist, and is connected with a pump or compressed air tank, in such manner that a constant pressure of 10 to 12 mm. of mercury may

be maintained within it. Separate vessels connected with the pump contain oxygen and the anesthetic. This method, the apparatus for which is described in detail and pictured, has the advantage of small size and low cost, and the increased intrapulmonary pressure has no injurious effect unless the pressure is made very much higher. The expansion of the chest causes the expansion of the lungs under normal circumstances, but if a large part of the chest wall is removed it no longer has the power to draw the lung down in inspiration, the air passing in and out of the pleural sac, although the lung is not collapsed. In spite of this lack of pulmonary expansion there is often so sign of dyspnea, and Mayer felt that part of the aeration of the blood must be carried on by the pleural surface. Experiments made by passing air through two fistulæ in the pleura showed that in a quarter of an hour 30 centigrammes of CO_2 were given off. This is much greater than the amount given off by the peritoneum. If the trachea is closed so as to prevent all respiration, the animal lives much longer if the chest wall is freely opened. Finally, gases such as hydrogen sulphide are absorbed much more rapidly from the pleura than from the rectum or peritoneum.

The amount of lung tissue that can be removed without interfering with oxygenation is very surprising. The left lung and half the right has been removed at once without causing death, and an animal lived a long time with no sign of dyspnea after removal of the left lung and the right upper lobe, and another after removal of the entire right lung. The deaths after resection of lung tissue are generally due to septic infection, and although this is generally the result of the escape of bronchial contents into the cavity Mayer was struck by the fact that every dog on which he performed resection of a rib died of septic infection. His technique for resection of the lung is now as follows: The apparatus of Sauerbruch or Brauer having been connected, a long incision is made in the middle of the seventh interspace, the ribs are separated, and the hand introduced into the pleural cavity grasps the lung and squeezes out the air and blood. A heavy silk ligature is then thrown around the hilus and the peripheral portion of the lung resected with the thermocautery. This seals the bronchioles and prevents hemorrhage. The cavity is then dried and the wall closed without drainage. The pump is stopped gradually. Many of the animals seem to bear the operation well, but die a few days after with signs of dyspnea. Autopsies on these animals showed that the cause of death was a phlebitis of the pulmonary vein. The clot extended to the point of ligature, and even beyond this to the heart. Death is due to the interference with the action of the right heart, not to loss of respiratory surface.

Mayer finally considers the justification of certain operations on the lungs, especially the excision of tubercular lesions. The curability of this disease in the early stages renders operation inadvisable, but in advanced cases, when the lesion is localized but has proceeded to cavity formation, operation is frequently justified. The best treatment here as elsewhere is to put the part at rest, and this is best done by making a large opening in the bony wall immediately over the cavity. This prevents expansion of the corresponding portion of the lung and has given very good results in a large number of cases, while excision of the diseased part has not been so successful. In injuries of the thorax it is best not to interfere unless the lung is so badly injured that it continues to bleed for some time or pneumothorax follows. Under such circumstances the pleura should be opened under negative pressure and the wound of the lung sutured. In cases of pyothorax, if recent, so that the lung is still elastic, the best treatment is drainage by means of a rubber tube which passes through the chest wall and dips by its lower end into a vessel of antiseptic solution. If, however, the case is of long standing it is necessary to open the chest freely, excise the thickened pleura, and obliterate the pleural cavity. In doubtful cases an exploratory opening should be made, and then if possible the wound closed and drainage used.

END-TO-END ARTERIOVENOUS ANGEIORRHAPHY.

LILIENTHAL (*Annals of Surgery*, January, 1907) after a futile administration of drugs for the cure of an arteriosclerotic gangrene of the foot, determined to attempt an end-to-end arteriovenous suture with the idea of arresting the necrotic process by diverting the arterial current into veins. With this end in view he made an incision over the popliteal artery, but found it absolutely obliterated. Some days later he made a four-inch incision crossing Poupart's ligament and running approximately in the line of the femoral vessels. On exposure of the femoral artery it was noted that its pulsation existed only in its uppermost portion, so that the anastomosis with the vein had to be made above the saphenous tributary. Femoral pulsation was controlled by a tape ligature clamped around the external iliac artery. A loosely knotted piece of catgut was also placed around this artery to be used in case of the accidental slipping of the tape. The vein was permanently ligated below this point at the same level as the temporary arterial ligature. The artery was then severed about one centimeter below the point of intended anastomosis, and the vein about the same distance above it. This allowed the mouths of the two vessels to be brought together readily. The stump of each vessel was carefully emptied of residual blood and was filled with sterile vaselin as advised by Carrel.

The stitches were passed by means of a No. 12 milliner's needle carrying 00 silk, the latter having been sterilized by vaselin. Three anchor sutures were passed, bringing the open mouths of the two vessels together, so that when stretched in different directions there was formed an equilateral triangle. Each stitch was passed directly through the coats of all the vessels in such a manner as to avoid the turning in of the walls, but rather to evert them ever so slightly to insure the contact of the intimas. By traction upon these anchor sutures, two at a time, the contiguous parts of the vascular walls were rendered straight and parallel, and were united by a running suture which was tied to an anchor suture as soon as it was reached. Just before tying the last running suture to its anchor the vessels were emptied of vaselin by gentle manipulation. The final knot being tied, the tape compressing the femoral artery was removed, and at once the pulsating current was established from artery to vein without the suspicion of leakage. Moreover, from the ulcer, which at the beginning of the operation was markedly cyanotic and did not bleed, bright-red blood began to exude. The patient was in a condition of shock at the end of the operation, which consumed about fifty minutes. Death occurred thirty-one hours after operation.

Examination of the anastomosis showed a smooth union with an extremely small clot in the vein, possibly formed just before death.

POSTOPERATIVE EVENTRATION.

RHEAUME (*L'Union Médicale du Canada*, vol. xxxv, No. 9, 1906) cites Wenter's statistics to the effect that of a thousand operations performed in the Berlin clinic one-third of the women subsequently suffered from eventration. If, however, the abdominal walls be sutured in three planes the accident occurs in only five per cent of cases. The author states that even with modern technique the accident is sufficiently common, and observes that the position of the incision is a distinct predisposing factor. The middle line, because of its lack of vascularity, heals slowly, and lacking in muscular elements readily gives way after consolidation. Drainage, suppuration, incisions of large size, and abdominal distention are all predisposing factors. The author advises opening the abdomen through an incision placed three or four centimeters one side or the other of the middle line. This cut is made as short as possible. Before closing the peritoneum tension sutures of silver are introduced, entering the skin about 4 centimeters to

one side of the cut, traversing obliquely the entire thickness of the abdominal wall, including the peritoneum, and emerging 4 centimeters on the other side. The peritoneum is then brought together by buried suture; a second suture approximates the anterior aponeurosis covering the rectus muscle, and a third suture closes the skin incision. Thereafter these sutures are relieved of all tension by means of little pledgets of absorbent cotton slipped over each end of the wire tension sutures, followed by one-eighth inch of drainage tube, and the whole clamped down against the skin by means of a perforated shot. When the incision is 10 centimeters in length a single relaxing suture is sufficient. A long incision requires two or three such sutures. They are left in place for about fifteen days.

As to the results, the author notes that sometimes a superficial sloughing of the skin is produced by a pledget of cotton. Because of lessened tension on the lines of suture suppuration is less frequent.

ACUTE INTESTINAL OBSTRUCTION FROM PARALYTIC DISTENTION.

A case of intestinal obstruction due to volvulus, which was mistaken for appendicitis, and operation delayed until too late, serves LENNANDER (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, Heft 1) as a text for a discussion of the treatment of paralysis of the bowel.

In abdominal conditions whose nature is obscure it is most important to determine whether an operation is likely to be necessary, and if so, to transfer the patient at once to a hospital, where the operation may be performed without delay. If the intestine is distended with gas, the rectum and stomach should each be washed out several times, and if this fails to bring away enough gas to reduce the abdominal tension, the transfer to the hospital should be made at once. Here the stomach and rectum are again washed out, and if the gas does not escape the abdomen should be opened. A certain amount of distention causes paralysis of the intestinal wall, and a paralyzed portion of the intestine is as impassable as a stricture. The paralyzed wall is easily penetrated by bacteria, and if operation is delayed peritonitis will result. Early operation is therefore demanded, and if we wait for such absolute signs of obstruction as fecal vomiting, the patient will probably die in spite of operation. The cases which get better, then worse, must be watched with particular care.

At the operation the bowel should be opened in several places. If the intestine is merely overdistended but not paralyzed it will immediately begin to move and continue to empty itself. If it is paralyzed it will not move even when empty. For this reason a permanent opening or fistula must be placed about the paralyzed part. If the upper part of the bowel is paralyzed, it is best to make the fistula in the stomach. The pyloric portion should be selected, as this empties itself most readily. If a large part of the bowel is paralytic, it is best to make a number of fistulas. The use of a glass tube is the best method of fistula formation, and on account of the valves a tube in the jejunum must extend at least four-fifths of an inch into the lumen of the bowel, and have at least three openings. If the size of the abdomen increases after the operation the stomach should be washed out, and if odorous liquid is found in it a gastric fistula should be made at once and the stomach kept empty. The fistula will always close promptly as soon as the pylorus is free and the tube is removed. If in spite of the bowel being emptied it cannot well be entirely replaced in the abdomen, it is best to leave the abdominal wound open, with the bowel outside. The mass of intestine is covered with a sheet of thin, smooth rubber, which is sutured at intervals to the parietal peritoneum. On this sheet is laid a thick, sterile, absorbent dressing, fastened with broad straps and covered by sterile wool, to keep the abdomen warm. The bowels gradually sink back into the abdomen, and the perineal secretion flows out between the rubber and the skin. The adhesions which form between the loops of intestine are much less firm than if the intestines were covered

with gauze, and a beginning peritonitis may even heal under the use of this dressing. The fact that adhesions are very slight, when rubber dam is used instead of gauze, makes the former more suitable for drainage. Gauze should no longer be used for this purpose in the abdomen.

A case is reported by Lennander (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv) in which the stomach was dilated as well as the bowel. A man who had always had stomach trouble, induced by congenital narrowness of the pylorus, was suddenly attacked with extreme pain in the abdomen associated with excessive distention with gas. As rupture threatened the abdomen was opened below the navel, the incision passing directly into the enormously distended stomach, which was full of gas and liquid, although lavage had brought nothing away, the stomach having lost the power to contract. The duodenum was also enormously distended, and the greater part of the jejunum and ileum was twisted 360 degrees on its mesentery. As the bowel had lost its contractility, a fistula was made in the jejunum and one in the ileum. The latter could be immediately closed. The openings in the stomach and jejunum were left. During recovery acute obstruction occurred from kinking. This was relieved and gastroenterostomy performed. Recovery was complete. In connection with this case Lennander lays stress on the advantages of a pyloric as compared to a duodenal fistula. The other cases of acute dilatation of the stomach which have been reported had the same symptoms as this case—excessive pain and distention, anuria, and collapse.

THE TECHNIQUE OF TUBATION OF THE PHARYNX TO FACILITATE ADMINISTRATION OF ANESTHETICS.

McHenry (*Long Island Medical Journal,* February, 1907) records his improved technique as follows: The patient is reduced to complete surgical anesthesia in the usual way. The pharynx is then cleansed by a small gauze sponge held by a long pair of forceps and cocainized by one-tenth per cent solution of cocaine. Two rubber tubes as long as will pass, thereby fitting snugly, cut on the bias and fenestrated laterally near the ends, are inserted into and through the nares as far back as the epiglottis, which will be felt as an obstruction to further passage of the tubes.

The mouth is then widely opened and the tongue drawn well forward and out.

With one good-sized gauze sponge the entire pharynx is then packed, while making traction upon the tongue, as far back as the tubes. This forms, when in position and properly packed, an air-chamber or space in which the tubes and larynx communicate.

The tubes are severed an equal distance from the nose.

The anesthetist listens carefully to ascertain if the patient is breathing through the tubes. If not the gauze packing in the tubes is too deep, allowing no space for air, and should, therefore, be repacked until rhythmical breathing is heard through the tubes. The tubes are now joined by a Y-shaped hard-rubber tube to which is attached by means of another rubber tubing a hard-rubber funnel covered with two to four thicknesses of gauze.

The anesthetic is then administered by pouring upon the gauze funnel.

It is held that the aspiration of blood and vomitus is impossible, and that the mucus forming in the throat is absorbed by the gauze sponge, which further acts as a hemostatic because of its pressure upon the base of the tongue, controlling to a great extent the hemorrhage, excepting in operations in which the lingual arteries have been severed. The head may be placed in almost any position advantageous to the operative technique regardless of resultant hemorrhage. The anesthetist, the cone and apparatus, are all removed from the field of operation.

McHenry emphasizes the necessity of using considerable gauze in packing the pharynx, so much as almost to fill the space; then subsequent loose packing of the remainder. But one piece of gauze is employed. He also insists upon the lateral

fenestration of the tubes at their ends, since the air space is greater from side to side than from before backward, and the plane of the bias-cut end should be downward and backward.

ROTARY DISLOCATION OF THE ATLAS.

CORNER (*Annals of Surgery*, January, 1907) observes that the atlas rests upon two oppositely inclined planes of the axis, and that in order to allow for the gliding movements of these joints the ligaments are lax and loose, in consequence of which the heads msut be held firmly by muscular effort and not by any other means. If this tonic muscular action is abolished the ligaments allow the head to rotate 30 degrees either side of the middle line.

Corner has collected twenty examples of rotary dislocation of the atlas, two occurring in his own practice. There is usually a history of accident in which violence is applied to the front and top of the head. Paralysis and anesthesia are absent, nor is there a recorded case of spinal concussion. The neck is stiff, tender, and capable of little movement. The head is flexed and turned a little to one side, usually the right. In severe examples it may be bent toward one shoulder, so that the chin points to the other side. Under such circumstances the head probably cannot be moved. In the less severe variety the head can be rotated more to the side to which it is directed than to the other. The side to which the chin is directed is that on which the transverse process of the atlas is rotated backward. The side to which the head cannot be rotated is wholly or only partially dislocated. The joint of the side to which the head is rotated is fixed, forming the center of a curve along which the other joint moves. Thus on turning the head to the right, the right atlanto-axial joint is fixed and the left moves. If the left side is dislocated the head can only rotate a little to the right, as the left joint does not exist. It can be rotated a little to the left, since the right joint can move only a little, as the forwardly dislocated left joint is the fixed point and will not permit more. Normally the transverse process of the atlas can be felt half-way between the tip of the mastoid process and the angle of the jaw. This can be felt plainly on the side from which the head is turned, unless when the patient looks forward it is hidden by the angle of the jaws. The side to which the head is bent cannot always be felt; the fingers sink inward and forward deeply into the neck, since the transverse process has been displaced backward. Over the back the spine of the axis, when it can be felt or seen, is deviated somewhat to the side from which the head is bent. This is due to the lateral curvature of the cervical spine caused by the flexion and rotation of the head. Great prominence means much forward displacement of the head, and therefore indicates that the odontoid process is probably broken. Examination of the pharynx reveals two prominences, that on one side being due to a forwardly displaced transverse process, and that on the other, which is bulky and less distinctly defined, being due to the part of the axis which has been rendered prominent by the backward displacement of the transverse process of the atlas on that side. Lateral skiagraphy shows a forward displacement of one side of the atlas owing to the transverse axis of that bone being oblique to the rays. It is most important to determine whether the odontoid process has been broken, since this latter complication greatly increases the danger of attempts at reduction. Anterior skiagraphy shows nothing, and owing to rotation of the head and patient's inability to open the mouth wide a skiagraph of the odontoid process cannot be obtained.

The points which are relied upon for diagnosis are the position of the head, the position and fixity of the transverse process of the atlas, the examination of the pharynx, and the skiagraph of the lateral view of the neck. There is usually nothing which will absolutely exclude fracture of the odontoid process.

In treatment the question is whether to reduce the dislocation or not. If the acci-

dent has already happened for a fortnight to a month, or the odontoid process is thought to be intact, an anesthetic may be given. In a number of the cases spontaneous reduction occurs when the muscles are relaxed. In others gentle traction upon the head and rotation will bring about the desired result, after which the head can be put up in a plaster-of-Paris collar or in wood-wool and bandages. If the odontoid process is thought to be broken attempts at reduction are unwise. The patient should be kept in bed with the head immobilized by a sand-bag, and three weeks later should be given an anesthetic to examine the pharynx and reduce the dislocation. Should the surgeon not reduce the dislocation the head is put in a poroplastic collar. The movements of the neck will return, but will be limited.

REVIEWS.

PHYSICAL DIAGNOSIS. With Case Examples of the Inductive Method. By Howard S. Anders, A.M., M.D. Illustrated. D. Appleton & Company, New York and London, 1907.

We are told in the Preface of this volume that it has a "double-barreled purpose," namely, to counteract as far as text-book influence may the tendency of students to rely upon laboratory methods rather than the methods of physical diagnosis in reaching an opinion concerning a case, and also to prevent them from reaching conclusions by superficial and hasty methods. The book follows the course usually laid down in most works devoted to physical diagnosis, first giving the topographical anatomy of the chest and then a description of the abnormal thorax, proceeding from this to the discussion of the various methods of palpation, percussion, and auscultation.

The second section of the book is devoted to a description of some of the diseases of the respiratory tract, "inductively considered," and consists of hypothetical and recorded cases. The third section of the book deals with the heart and pericardium and with the blood-vessels. Section V deals with the general examination of the abdomen, Section VI with the special organs of the abdomen, and Part VII with the use of the Roentgen ray in medical diagnosis. Much more space is devoted to this method of diagnosis than is commonly found in books devoted to this subject. A large number of the illustrations are taken from Butler's work on Diagnosis, published by the same house. The book does not profess to be one including much original observation, but is a good summary of the subject of which it treats, and it can be put in the hands of students with advantage.

MEDICAL JURISPRUDENCE, FORENSIC MEDICINE, AND TOXICOLOGY. By R. Witthaus, A.M., M.D., and Tracy B. Becker, A.B., LL.D. Second Edition, Volume II. William Wood & Co., 1907.

A number of months ago we took pleasure in calling attention to the fact that the first volume of the second edition of this work had appeared from the press of Messrs. William Wood & Co. The first edition so quickly took its place as a standard reference work on the subject with which it deals that the road to popularity for the second edition is an easy one to travel.

The opening pages of this second volume contain tables of cases cited, and then under the head of Forensic Medicine a chapter is taken up on the medicolegal consideration of wounds of all kinds, except gunshot wounds, by Dr. George Woolsey, of New York. His article covers nearly 150 pages, and is followed by one by Dr. Roswell Park, of Buffalo, upon the forensic relations of gunshot wounds, and this in turn by one upon the medicolegal relations of electricity by Dr. William N. Bullard. The next part of the volume is taken up

with chapters upon strangulation and hanging, abortion and infanticide, and with those medical examinations of the living human body which are required or permitted by courts of law. This chapter is followed by one upon rape, another upon unnatural crimes, and others upon railway injuries.

The value of this work to surgeons and physicians who may be called upon to testify in medicolegal cases cannot be estimated. It is so full of valuable advice and pointed references, and is so evidently compiled by men who emphatically write from the standpoint of experience, that its contents are worthy of our most careful consideration.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. With Special Reference to the Application of Remedial Measures to Disease and Their Employment upon a Rational Basis. By Hobart Amory Hare, M.D., B.Sc. Twelfth Edition, Enlarged. Price $4.00.

The preface of the twelfth edition of this book is self-explanatory:

"Since the appearnace of the eleventh edition of this book eighteen months ago it has been necessary to reprint it on three occasions, a fact which would seem to indicate that the text continues to meet the needs of practitioners and students. In presenting the twelfth edition the author wishes to state that he has thoroughly revised it, and in many ways endeavored to increase its usefulness. More complete information is given as to Materia Medica than ever before, and a considerable number of the recent advances in therapeutic procedure have been introduced. Thus, the value of citrate of sodium in the feeding of bottle-fed babies, the use of calcium lactate, hypodermically and by the mouth, in hemophilia, urticaria, and oozing hemorrhage, are discussed. More information is given as to the best methods of treating syphilis by the hypodermic injection, and the importance of using saline solutions of exact strength for intravenous injection is emphasized. So, too, the value of citric acid for preventing thrombosis in typhoid fever is considered, as is the important subject of the danger of toxemia after the use of chloroform and ether. A very considerable number of drugs which have been introduced during the last two years, or which having been introduced but a short time when the eleventh edition appeared did not seem worthy of mention, but which have since proved their usefulness, are discussed. The author is also glad to state that through the courtesy and kindness of Dr. G. E. de Schweinitz, Professor of Ophthalmology in the University of Pennsylvania, the articles upon the treatment of the common diseases of the eye have been carefully revised. So, too, Dr. Barton Cooke Hirst, Professor of Obstetrics in the University of Pennsylvania, has revised the articles on the treatment of Diseases of the Puerperal Period, and Dr. Edward Martin, Professor of Clinical Surgery in the University of Pennsylvania, has revised the articles upon Antisepsis, Gonorrhea, and Syphilis. It is also perhaps worthy of note that since the appearance of the eleventh edition this book has been translated into the Italian and Chinese languages."

ATLAS AND EPITOME OF DISEASES OF CHILDREN. By Dr. R. Hecker and Dr. J. Trumpp. Edited by Isaac A. Abt, M.D. W. B. Saunders Company, Philadelphia, 1907.

Many of the profession are familiar with the excellent series of atlases published by the W. B. Saunders Co., of which this is one. The present issue is of the best. It does not pretend to be a complete compendium of diseases of children, but, as its name indicates, an atlas illustrating various types of disease, both internal and external, accompanied by sufficient text to make the plates interesting and valuable.

THE TREATMENT OF SKIN CANCERS. By William S. Gottheil, M.D. International Journal of Surgery Co., New York, 1907.

Many of the readers of the THERAPEUTIC GAZETTE are familiar with the writings of Dr. Gottheil, who is known as one of the foremost dermatologists of the day, possessing not only practical skill but the ability of describing in an interesting way the methods to which he resorts in the treatment of patients suffering from lesions of the skin. The pages of this tiny volume, which has now reached its third edition, deal chiefly

with the use of the *X*-Rays, Radium, and the High-tension Current as means of treating skin cancer. Many illustrations have also been introduced illustrating the effects which the author has obtained by the use of these measures.

A Text-book of Materia Medica for Nurses. By George P. Paul, M.D. The W. B. Saunders Company, Philadelphia, 1907.

There are so many excellent books of this character already on the market that one naturally looks through the pages of this one to determine whether it differs materially from its predecessors. The drugs are considered in alphabetical order. There is a part devoted to new medicinal agents in which many of the newer drugs are considered. There are also chapters upon hydrotherapy, heat and cold, and remarks in regard to the employment of various antiseptics and antitoxins. Very little attention is given to the direct therapeutic application of the drugs. Considerable attention is paid to dosage and official nomenclature.

Text-book of Embryology. For Students of Medicine. Price $3.00. By John Clement Heisler, M.D. Third Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1907.

Previous editions of this well-known book on Embryology have been reviewed in terms of praise in the Therapeutic Gazette. The present volume possesses all the advantages of the earlier editions, and is perhaps the best which can be placed in the hands of students for studying human embryology. The type is clear, well-spaced, and the illustrations are excellent.

A Practitioner's Handbook of Materia Medica and Therapeutics. To which are added some Pharmaceutical Data. By Thomas S. Blair, M.D. The Medical Council, Philadelphia, 1907.

This book finds its reason for existence in the therapeutic optimism of the author and in his strong belief that moderate doses of active drugs are what is needed in the majority of cases. Unlike most books of the present time which are devoted to this subject, it covers not only those remedies which are commonly employed by so-called regular practitioners, but also many of those which are used by eclectics and homeopaths. As the book is a small volume of only about 250 pages, it can readily be understood that the description of each individual drug cannot be at all exhaustive. As a text-book of therapeutics it is incomplete. As one which will give practitioners many useful little helps in regard to the frequency and manner of administering drugs it can be commended.

Hints on the Management of the Commoner Infections. By R. W. Marsden, M.D. E. B. Treat & Company, New York, 1907.

This little book is designed by its author to give minute details in regard to a number of remedial measures which are commonly resorted to by physicians. The first chapter deals with the modes of applying cold to the skin, with the arrangement of the bed of the invalid, and discusses ventilation, feeding, drugs, and stimulants. As all of this is included within the brief space of 29 pages it will be seen that it is not very exhaustive. The second chapter is divided into 27 parts, in which the treatment of a very large number of infectious diseases is briefly gone over. We fail to see the niche which this book will fill in medical literature, as it is too brief to be of much value to the student or practitioner.

The Practice of Gynecology in Original Contributions by American Authors. Edited by J. Wesley Bovee, M.D. Illustrated. Lea Brothers & Co., Philadelphia and New York, 1906.

This book is offered the profession as a practical treatise on Diseases of the Generative Organs of Women and of the Urinary System and Rectum. Its contributors are Bovee, Goffe, Miller, George H. Noble, Schenck, Watkins, and Werder. The last named author contributes the first chapter upon Examination of the Pelvic Contents, which is brief but to the point.

Bovee writes upon Developmental Anomalies of the Female Generative Organs, illumining his article with a series of striking illustrations.

Goffe deals with the subject of Menstruation, including under this heading the menopause. The chapter upon Displace-

ments of the Uterus gives small place to any treatment other than operation.

Noble's section upon Fecal Fistulæ Connecting with the Female Generative Organs is particularly well done, the illustrations in themselves being almost enough for the enlightenment of the practiced surgeon. Lacerations of the Perineum; Diseases and Injuries of the Vulva and Vagina, are equally well treated by him. In considering the treatment of sterility he holds that vicious sexual habits are largely responsible for the increasing proportion of neurasthenic women, and advises as a remedy against sterility that "it is better copulation should occur twice within a few hours with abstention for ten days than once every one or two days."

Bovee contributes a brief and very excellent chapter upon Diseases of the Rectum and Anus. Inflammations of the Uterus, Lacerations of the Cervix, Fibromyomata and Malignant Tumors are adequately discussed by Miller.

Goffe gives in minute detail the vaginal method of operating, whilst Werder, with an equal thoroughness, takes up the abdominal operation, together with its complications. Diseases of the ovaries and Fallopian tubes are given more careful consideration than is usually awarded to them in text-books on gynecology. The book closes with a brief but very excellent series of chapters on the urinary tract.

This work is scholarly, comprehensive, modern, and thoroughly satisfactory.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D., F.R.C.P.

Amongst recent papers of interest must be mentioned one read by Dr. D. B. Lees at the Hunterian Society on the administration of salicylates. Very different opinions have been held as to the value of salicylates in rheumatism. It has been asserted by some physicians of large experience that these salts have no effect whatever upon rheumatism beyond relieving pain in the joints, and many have held that so far from exercising any beneficial effect on the cardiac complications of rheumatism, the salicylates aggravate the acute heart inflammations of rheumatism by their depressing effect. Dr. Lees in his recent address declared that the salicylates have just as specific an effect in rheumatism as quinine has in malaria or mercury in syphilis. The supposed depressing effect of the salicylates is due, he said, not to the drug but to the disease; the symptoms due to bad heart disease or to the rheumatic toxin are attributed to the drug. This is particularly unfortunate, for physicians consequently give the drug in far too small doses; and this is the reason why in many instances no good effect is observed. He admitted that vomiting, tinnitus, and other unpleasant effects occasionally occur where large doses are used, but the indication then is not to abandon the drug but to reduce the dose temporarily, after which it will often be found that the patient can take even a larger dose than that which previously had a toxic effect. He had given as much as 600 grains of sodium salicylate with 1200 grains of sodium bicarbonate in twenty-four hours to a boy aged fifteen years, and had continued 500 grains of the salicylate per diem for three weeks. He emphasized the importance of combining the sodium bicarbonate with the salicylate, otherwise a dangerous toxic condition might result, resembling in some respects diabetic coma. The sodium salts he considered preferable to the potassium salts, as being less depressing; but he would not admit that even in acute pericarditis anything but benefit is likely to result from the administration of large doses of salicylate.

A notable event of the past month was

the eightieth anniversary of Lord Lister's birthday. Addresses of congratulation were sent not only from most of the scientific bodies in this country, but from all parts of the world—a well-merited tribute of universal respect to the man who made possible the triumphs of modern surgery, and whose gospel of asepsis has saved multitudes from suffering and from death. A more permanent tribute is to be the publication of all his writings, which are to be collected and published in suitable form, by a committee of distinguished scientists from many countries.

There is in London an Institute of Hygiene, at which lectures of a semipopular character are frequently delivered by well-known medical men. During the present month Dr. Rentoul, of Liverpool, who has written much on the social aspects of medicine, advocating for instance the sterilization of mental and physical degenerates, discoursed nominally on "Woman's Health, Our Greatest National Asset." His lecture, however, was mainly a plea for some revolutionary methods of insuring matrimonial bliss, so far as medicine and law combined can do this. He would tax bachelors, he would reduce taxation for the needy couple who showed their merit by being prolific; proof of disease in the rejected party should absolve from breach of promise; no one should be allowed to marry without a certificate of good health; and so on and so forth. All very excellent, no doubt; but what about the winged boy with the bow?

The few cases of "spotted fever" which occurred in London have not led to any epidemic outbreak during the past few weeks; and no such prevalence has been noticed here as in Edinburgh and Glasgow. London, indeed, heartily abused as it is by many of those who dwell in it, remains after all a remarkably healthy place.

Sir Frederic Treves and Sir Francis Laking, the surgeon and physician who had charge of the King during his attack of appendicitis in 1902, have received an unusual honor in being allowed to add to their shields one of the lions of the royal arms. Apart from the pleasure which the whole profession in this country feels in any honor conferred upon its members, it is specially gratifying that the King, who indeed is himself an Honorary Fellow, and the only Honorary Fellow, of the Royal College of Physicians, entertains so high an opinion of the medical profession.

A new medical society is to be added to the many already existing in this country, but upon different lines from those which have hitherto been usual. Its membership is to be limited to physicians who are actively engaged in the teaching of medicine or in research, and the society, which is to be called the Association of Physicians of Great Britain and Ireland, is to meet once a year for three days in university towns, and towns which are the seat of recognized medical schools. One important difference between this society and other medical societies is the exclusion of reporters from its meetings—a boon indeed, and a rule more likely to promote free and useful discussion than any other regulation could do. There is some talk of publishing an "Archives of Medicine" in which the papers of this association of physicians might appear, a journal to be devoted purely to medicine as distinct from surgery; but at present this is somewhat *in nubibus*

Among the deaths in the medical profession during this month must be mentioned that of Dr. W. H. Ransom, of Nottingham, whose name, although he had retired from practice, was familiar in this country. He was elected a Fellow of the Royal College of Physicians nearly forty years ago, and for his distinguished position in medical science had received the Fellowship of the Royal Society. Another well-known member of the profession, whose name however is connected more closely with the literary aspect of medicine than with its practice, was Mr. T. H. Wakley, editor of the *Lancet* and son of the Mr. Thomas Wakley who originally founded the *Lancet*. Mr. Wakley died this month at the age of eighty-six years.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., JULY 15, 1907. | Third Series, Vol. XXIII, No. 7.

ORIGINAL COMMUNICATIONS.

THE MANAGEMENT OF PREGNANCY.

BY REUBEN PETERSON, M.D., ANN ARBOR, MICHIGAN,

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The general practitioner, as a rule, has very little to do with the management of pregnancy. Not infrequently he does not see the pregnant patient until he is summoned to the labor, the husband taking it upon himself to engage the physician for the confinement. Again, the latter may see the patient but once during her pregnancy, when he estimates the probable date of confinement and makes arrangements for a suitable nurse. At times the patient is directed to send occasional samples of urine to the office, but if these directions are not followed their importance is seldom insisted upon. Only in the advent of some palpable pathologic condition does the physician arouse himself and take a seeming interest in the case. Of course there are notable exceptions, where the medical attendant performs his full duty, but his practice differs so markedly from that of his colleagues that he is actually placed on the defensive lest he be charged with being fussy, or still worse, with the desire to increase the size of the bill.

Now this neglect of the pregnant patient is not confined to certain localities or to certain types of practitioners. It is all too common in the cities, as well as in the country districts. And because of this wide distribution there must be an underlying cause or causes. Such neglect cannot be ascribed to ignorance, for the average physician knows full well what at times may happen to the pregnant patient. The obstetric art appeals to the American physician perhaps as does no other department of medicine. His practical mind delights in meeting and solving the problems presented by abnormal labors. Eagerly grasping anything of use to him in the practice of his art it would indeed be strange for him not to have a general knowledge of the various complications of pregnancy. Thus his inertness cannot be ascribed to a lack of knowledge. To what then is it due? To a number of things, I believe.

It is perfectly proper to consider pregnancy and labor as physiologic processes. Every good physician is more or less of an optimist, and is apt to look upon the habitual alarmist with some suspicion. He dislikes to be classed with those practitioners to whom every cold is a pneumonia and every fever, typhoid. Hence he tries to assuage the fears of the young wife about to become a mother with the statement that childbirth is a perfectly normal process, and that she must pay no attention to the scare stories of her officious friends and neighbors. So earnestly engaged has he been for many years in this calming campaign that it is no wonder that the people have taken him at his word. Labor, however, is associated with pain, and is dreaded to such an extent that the services of the physician are considered indispensable. But not so with pregnancy: the nine months

constitute a tedious period which must necessarily be gone through with, but that is all. It never occurs to the average pregnant patient that of the two periods, pregnancy and labor, the former is more likely to be fraught with danger.

The physician, then, is responsible for the present attitude of the laity regarding the pregnant state. It should be stated to the patient fairly, as I believe it is not, that while fortunately in the vast majority of cases the normal woman passes through her pregnancy in a perfectly normal manner, in a certain percentage of cases there are complications. It should be emphasized that the only way to avoid such complications is to be under the direct supervision of a trained medical attendant; for nowhere else is prophylaxis of more avail, and it is the physician's duty to continually preach its necessity. In fact, were it not for the small percentage of abnormalities during pregnancy, labor, and the puerperium, the physician's services could very well be dispensed with altogether. Where the doctor is called at the time of labor and departs immediately after the birth of the child, with no intention of seeing the patient again, the fee, no matter how small, has not been earned. Of what real service has the physician been? To be sure he may have been a most sympathetic and interested spectator of the parturient act, but in the normal case the woman would have got along just as well without him. Occasionally he steps in and does something, but usually he has no knowledge of what complication is liable to arise. What would we think of the captain of a passenger steamer who, with no knowledge of the condition or capacity of his vessel, calmly sees her entering a narrow and difficult passage without any particular guidance. Usually vessels get through all right, and he trusts to luck that his will. We may praise his courage and skill in doing what he can to save the passengers and vessel after she has struck the rocks, but the praise is faint at the best. It was his business to know how to keep off the rocks.

There is no question but what the public could be taught the importance of a careful supervision of pregnancy. If this statement be doubted, it is only necessary to review the history of appendicitis. Not so many years ago it was no easy task to persuade the patient with acute appendicitis to submit to immediate operation. Now, after a comparatively short campaign of education, it is difficult to prevent each and every patient with a pain in the right side from having the abdomen opened.

Then why does the practitioner, knowing what may happen to the exceptional pregnant patient, fail to take a hand in the management of pregnancy? Why does he trust to luck when he knows full well that luck will be against his patient in a certain percentage of cases? Humiliating as such a confession may be, I believe that financial considerations have much to do with the neglect of the pregnant patient. For the physician is undoubtedly miserably compensated for his obstetric work. The same man who cries out against the contract physician, declaring his conduct unethical, will contract to care for a woman during her confinement on terms so low that Chinese cheap labor would scorn to compete with them. The laborer is worthy of his hire—except the medical laborer. Obstetric fees were fixed long ago, when the cost of living was cheap as compared with what it is to-day. The compensation for all kinds of work has increased proportionately in all walks of life except that of medicine. Here the fees started low and have never advanced in any appreciable degree. As members of a noble profession, it may not be fitting to be always harping on the money side of our calling. Yet the discussion of this question is forced upon us if it be true that the real reason for the neglect of the pregnant patient is that the doctor feels that at the contract price he cannot afford to give up more than a minimum amount of time to his patient.

Even if he makes the necessary and careful examinations of the urine during pregnancy, the physician does not dare

charge for such work. In case he does have the courage of his convictions and makes a nominal charge, he is unfavorably compared with his competitors. Now the doctor could possibly stand the resulting loss of patronage if he felt that he was right and that he was fighting for a principle, but he cannot stand out long against the insinuation, which not infrequently accompanies such criticism, that an attempt is being made to increase the size of the bill. That last is the final straw, and he continues in the way of his predecessors and either neglects the pregnant patient entirely or looks after her interests in such a careless fashion as to make the result valueless. However, it must be said to the doctor's credit that if his patient becomes seriously ill or is in great danger she is not neglected, pay or no pay. But the mischief has often been done before the medical attendant has been aroused to action.

What then is the remedy for such a state of affairs? It would seem very simple. The situation demands concerted action on the part of the profession. Let it be thoroughly understood that the best interests of the patient demand that she receive more attention at the hands of the physician. Once let the public be thoroughly instructed in this matter and the rest is easy, for the average patient is no fool and does not care to take unnecessary risks. When all this is accomplished, the physician will receive the proper compensation for his work. The ridiculously low fee now charged for the average confinement will be raised to one commensurate with the responsibility of the accoucheur and the amount of time he must devote to his patient.

The patient should be taught the importance of consulting her physician as soon as she is reasonably certain she is pregnant. In a woman who has always been regular this will be soon after the non-appearance of the first menstrual period. A woman of less regular habits will not be sure she is pregnant until a longer period has elapsed.

History of the Case.—This should be carefully taken at the first interview, unless the physician be already conversant with the patient's medical history. Even a knowledge of the family history may not come amiss, and may put the practitioner on his guard for outbreaks of nervous and mental disorders.

The personal history is of even greater importance. Previous attacks of the infectious or contagious diseases may have seriously weakened important organs, as the heart or kidneys, which have to be watched and supported, when subjected to the additional strain of pregnancy. In the same way it is of the utmost importance that the physician should have a knowledge of such diseases as syphilis, rickets, and tuberculous joint affections, because of changes in the bony pelvis which may result from these diseases.

A history of previous attacks of pelvic inflammation would suggest the probability of damaged and adherent appendages. Previous gonorrheal inflammation may have resulted in a pelvic exudate, which holds the uterus firmly in abnormal positions. Upward movement of the enlarging, pregnant uterus thus becomes interfered with, and abortion or incarceration of the uterus is the result.

In the same careful manner an accurate history of previous pregnancies should be secured. The number, dates, and causes of the interrupted pregnancies should be ascertained, if such accidents are to be avoided in the future.

All facts relating to full-term pregnancies, labors, and the puerperia should be carefully recorded and studied. For example, a history of previous eclampsia, placenta previa, or insanity should put the obstetrician on his guard for repetitions in succeeding pregnancies.

All data relating to the child should be collected. Abnormal weight and size are apt to repeat themselves in subsequent children, and may even call for an early interruption of the pregnancy in the interests of both child and mother. The knowledge that a child of average size was born to a mother with a minimum amount of pain

and discomfort is of far more value than dozens of measurements of the pelvis with a pelvimeter.

With a little practice such a history as just outlined can be taken in a very short time. It can be filed away and will always be handy for future confinements. The busy practitioner is not expected to collect long-drawn-out statistics, but simply to collect data which may prove of value to him in the future management of the case.

Objective Examination.—For a number of reasons it is best that the patient be subjected to a thorough physical examination immediately after the taking of the history. In case the pregnant patient be the victim of pulmonary or other form of tuberculosis, it is highly essential for the physician to ascertain her exact condition early in pregnancy. The same may be said of cardiac, hepatic, and renal disorders. The physician needs to know of the existence of a retroverted, adherent, gravid uterus in the early stages of pregnancy, if his efforts to remedy the condition are to prove of any avail. Again, in primigravidæ it is important to recognize pelvic contraction early, in order that we may be prepared to institute appropriate treatment at the right time.

The obstetrician should neglect no general or special methods of examination which may be of service in forming an intelligent opinion of the patient's condition. Especially should the heart and lungs be carefully examined, unless such examinations have been made just prior to the pregnancy. Any variation from the normal in these organs may call for frequent and more extensive examination.

The breasts should now be examined. Size, shape, glandular tissue, and condition of the nipples are some of the things to be noted. The abdominal walls should next be inspected. Extreme pouching of the abdominal walls due to excessive stretching at previous pregnancies and separation of the recti muscles may call for a supportive abdominal bandage later in the pregnancy.

By external pelvimetry a general idea of the size of the pelvis can be obtained. Internal measurements will not be called for unless the external measurements are found to be markedly less than normal.

The external genitals should be inspected and abnormalities noted. A bimanual pelvic examination should be made in every pregnant patient as a routine procedure. Only exceptionally will it be objected to even by the most modest and sensitive patient, if its necessity be carefully explained.

Abnormalities of size, position, and density of the gravid uterus and appendages should be sought for and a general idea obtained of the capacity of the pelvic basin.

Next comes the examination of the urine, followed by general advice to the patient. Such advice should be given early in pregnancy, if the best results are to be accomplished. Then is the time to give directions regarding exercise, diet, dress, etc., all of which comprise the hygiene of pregnancy.

Selection of a Nurse.—It is surprising to see the indifference of the majority of physicians to the kind of a nurse engaged for the obstetric case. The selection is usually left to the patient, whose choice is guided by whim or advice of friends as ignorant as herself as to the essential qualifications of a good nurse. This indifference on the part of the profession is all the more astonishing when they must know that a patient is in constant danger from the administrations of a dirty and officious nurse. This custom of leaving the selection of the nurse to the patient and trusting to luck that nothing will happen belongs in the category of evils discussed above, and will disappear when the proper reforms are instituted.

It should be the practitioner's duty to keep upon his list a sufficient number of nurses, so that a proper selection can be made for his various patients. Whether these nurses be graduates of training schools will depend largely upon the community in which his practice lies. It is perfectly possible to train any intelligent

woman to be a competent and trustworthy nurse. Hence, neglect of the pregnant patient, so far as the selection of a proper nurse is concerned, is inexcusable.

The patient will gladly leave the selection of the nurse to a physician she has confidence in. In case there are objections and an incompetent nurse of the family's own selection is insisted upon, it is far better for the physician to withdraw from the case than to sanction what he knows to be dangerous to the patient.

The patient should be informed at the first interview that a suitable nurse will be sent to her for approval, and that the physician will give full instructions to the nurse regarding the preparations for the confinement.

Diet.—As a rule the average, normal pregnant patient can be allowed the various kinds of food and drink she has been accustomed to. This holds true provided such patients have not been excessive in their eating and drinking. A hearty, robust, non-pregnant woman usually eats one-third more than is actually necessary to maintain her in perfect health. The excess is usually well taken care of, at least for a number of years, by perfectly normal organs of elimination. The conditions may be entirely changed, however, if she becomes pregnant. Elimination may not be as active, and the excess of food and drink is not taken care of, becomes locked up in the system, and is at once a menace and source of danger to the patient. Hence, where a woman is a hearty eater she should be advised to cut down her diet during pregnancy. On the other hand, the physician should point out to his patient the evils resulting from a too restricted diet. Not a few women have an idea that such a diet, by decreasing the size of the child, will lead to a short and easy labor. The patient should be told that such a proposition has not by any means been scientifically proved, while the evils resulting from a lack of proper nourishment are matters of common, every-day observation.

More specific directions in regard to the diet may be necessary to tide the patient over the first few months of pregnancy, when nausea and often vomiting are apt to be annoying symptoms. The patient should be urged to depend upon small amounts of food and drink taken at frequent intervals. This plan will be found much more efficacious than the eating of three hearty meals a day. Hot drinks, such as coffee or tea, before rising in the morning are often grateful to and well borne by the stomach. Finally, the patient should be advised to partake of food, no matter whether she desires it or not. So long as it is not rejected it is in most instances absorbed, and is useful in keeping up the strength of the patient. Such advice seems necessary in view of the fact that many patients, unused to nausea, become discouraged and do not try to eat. Loss of weight and strength and impoverished blood may be the result.

Clothing.—Here again the physician should avoid extremes in his advice. The woman should be sensibly dressed during pregnancy, if at no other time. On the other hand, advice in regard to the proper clothing must conform in a certain degree to the prevailing custom, or else such advice will be disregarded altogether. The evil effects of tight corsets upon both mother and child should be explained to the patient. She should be advised to discard the corset and substitute some form of loosely fitting waist from the fourth month on. Such a waist will give the necessary support to a back long accustomed to a corset, yet there will be no undesirable pressure upon the expanding uterus. The patient should be urged to adopt a style of dress suitable to her condition, so that proper exercise can be taken without causing her excessive embarrassment.

All clothing should be supported from the shoulders, thus doing away with constricting bands. Stocking supporters should be given preference over garters, as the latter increase the tendency to varicose veins, so common in the pregnant patient. The kind and amount of underclothing can safely be left to the good

judgment of the patient. Close drawers need not be insisted upon, as it has never been proved, nor does it seem reasonable, that the dust of the street can find its way into the vagina of the pregnant woman.

Exercise.—The pregnant, like the non-pregnant, patient should be encouraged to take a certain amount of the proper kind of exercise. Each case is more or less a law unto itself. The exercise which agrees with one woman and keeps her in the best condition will prove inadequate for another patient. A woman unaccustomed to exercise, the possessor of weak and flabby muscles, should be warned against a sudden change in her habits upon the advent of pregnancy. This is particularly applicable to a certain class of idealistic, expectant mothers, who, from a sense of duty, may take up certain positively harmful forms of exercise.

In a general way the patient should exercise according to her usual custom. If she has been in the habit of taking long walks, these will prove most beneficial to her while pregnant. On the other hand, the woman who rarely walks, but usually drives, will undoubtedly receive the most benefit from such exercise. Whether the pregnant patient in the early part of her gestation can continue to indulge in such sports as tennis, golf, bicycling, automobiling, etc., will depend again largely upon the patient and the kind of uterus she has. The most violent exercise will have no effect upon some women, while in other women apparently harmless forms of exercise will interrupt the pregnancy. Until he knows the type to which the particular uterus belongs, the physician should counsel his patient against all forms of violent exercise. In this way falls and external violence are best guarded against.

With women in normal health railroad journeys are not, as a rule, contraindicated. At least this is true in the earlier months of pregnancy. The same cannot be said of women whose uteri are in a state of unequal equilibrium and liable to cast off their contents at the least provocation. In the case of such patients any shaking or jarring must be carefully avoided.

When the woman is constitutionally weak, or when she is extremely prostrated by her pregnancy, massage or selected Swedish movements may prove of great value as a substitute for, or as an adjunct to, active exercise. For obvious reasons massage of the abdominal muscles is contraindicated.

Fresh Air and Sleep.—An abundance of fresh air is almost essential to the well-being of the pregnant patient. Impure air will not only have a tendency to augment any inactivity of the organs of elimination, but by depriving the maternal tissues of the requisite amount of oxygen will have a most deleterious effect upon the fetus. For these reasons alone the patient should be urged to spend as much time out-of-doors as she can. For the same reason the air of the sleeping apartment should be made as pure as circumstances will permit, although direct drafts should be avoided.

Whatever may have been the patient's custom prior to pregnancy, during this period an abundance of sleep is highly essential. Excitement or anything tending to interfere with sleep should be avoided. Whenever possible an afternoon nap should be taken, or when the patient is unable to sleep during the daytime an equal amount of time can very profitably be spent in resting in the reclining posture.

Care of the Skin.—The skin should receive particular care during pregnancy, for, as one of the principal eliminating organs, its services may be called upon at any time. Just how the skin should be kept active will depend largely upon the patient's habits and surroundings. For the physician to insist that every pregnant woman take a daily tub or sponge bath would only expose him to the ridicule of a certain class of patients, who look upon a bath every month as frequent enough. But at least the physician can explain that frequent bathing not only is not injurious to the pregnant woman, but on the other hand is to be recommended. The woman accustomed to her daily tub or sponge

need not discontinue it during pregnancy. She should, however, avoid extremes of temperature if such are productive of shock. The external genitals should receive especial care and be kept scrupulously clean. Directions are sometimes necessary in this regard, because of the opinion that the genitals of the menstruating or pregnant woman should not be bathed.

Care of the Teeth.—Whether it be due to the superabundance of certain acids during pregnancy or to some other cause, there seems to be evidence that women are more subject to dental caries during pregnancy than at other times. Hence especial care should be devoted to the teeth during this period. Frequent use of such alkalies as milk of magnesia or lime-water is indicated. The tooth-brush should be used conscientiously after each meal, and the toothpick and dental floss should not be neglected. Whether dental work should be allowed or advised must depend upon the patient. In the majority of instances even extensive work upon the teeth would probably not be particularly dangerous, as far as the interruption of pregnancy is concerned. But since one can hardly foretell what the outcome will be, whenever the teeth demand immediate attention temporary fillings would seem safer, because such work can be performed much more rapidly.

The same advice will apply to all operative procedures. Because of their possible effect upon pregnancy, since it is impossible to predict what will happen in a particular case, they should be avoided whenever possible. On the other hand necessary operations should not be deferred, since in only a small percentage of cases will there be any untoward accident, as far as the uterus is concerned.

Care of the Bowels.—Constipation is only too common in the pregnant patient, and unless remedied the results may be disastrous. It is more common during the latter part of pregnancy because of the encroachment of the growing uterine tumor upon the normal position of the intestines, with resulting diminished peristalsis. The large intestine from the rectum to the ileocecal valve may be blocked with large accumulations of fecal matter. Fever, palpitation, dyspnea, headache, are not infrequent, and, combined with the toxemia due to absorption of the retained masses, may prove not only annoying but actually dangerous to the pregnant patient. The cramping pains toward the latter part of pregnancy often are not false labor pains, but arise from the efforts of the loaded intestine to free itself.

The patient is usually unconscious of her true condition, and even may be taking home remedies to check the frequent liquid evacuations resulting from the irritation set up by the impacted material. Therefore from the onset of pregnancy the patient should be given both general and detailed directions as to the care of the bowels. With this end in view the diet should be carefully regulated. If well borne by the stomach, fruit, vegetables, and breads made of the coarse flours should be liberally partaken of. Water should be taken freely, and large quantities of tea avoided. The physician should avoid the use of drugs unless the above measures fail. If driven to prescribe, only the milder laxatives should be employed, as abortion not infrequently results from the use of the more active cathartics. Small doses three times a day will be found to act better than larger doses at bedtime. From time to time the lower bowel should be thoroughly emptied by a soap-suds enema. Where the lower bowel is filled with fecal matter high enemas of sweet oil, followed by copious suds enemas, together with the liberal use of castor oil by mouth, will usually prove effective.

Care of the Breasts.—If the corset be discarded early in pregnancy, the breasts and nipples will be relieved from injurious pressure. Too often, however, tight corsets have driven in and caused an atrophy of the nipples, the resulting condition interfering with subsequent nursing. Whether during pregnancy such retracted nipples should be stretched and pulled outward must depend upon the susceptibility

of the uterus to such manipulations. If there be the slightest indication that the latter are setting up uterine contractions, such treatment should cease at once and not be resumed. The breasts, and especially the nipples, should be kept scrupulously clean. No alcohol, solution of tannin, or any other supposed hardening drug should be applied to the sensitive nipples. Not only are they useless, but they may do positive harm. Finally the breasts, when unusually heavy, should be supported by an appropriate bandage.

Marital Relations.—It is useless for the physician to direct that coitus cease during the pregnant period. Besides the fact that such advice will not usually be followed, it is questionable if the advice itself be good. The physician is not always in a position to judge what might follow such advice, if carried out, for the pregnant patient is naturally reticent in regard to marital difficulties. The question would much better be left for settlement to each patient provided she be fully informed as to certain dangers which may arise in her present condition. She should be warned against too frequent or too violent intercourse. An irritable uterus, one liable to throw off its contents at the least provocation, is peculiarly liable to be excited to abnormal contractions by intercourse during those periods at which the menstruation should normally appear. Hence at these times there should be no intercourse. Again, in order to avoid infection, there should be no coitus during the two weeks prior to the expected date of confinement.

The Kidneys.—Undoubtedly under exceptional circumstances it is possible for eclampsia to occur without any changes in the urine appearing before the convulsive seizures. But the physician must not be deceived by such exceptional cases, and conclude that the urine furnishes no reliable index to the patient's condition as regards elimination. While eclampsia, hyperemesis gravidarum, and other serious obstetric complications probably are due to failure in the functions of a number of organs, it is also true that the tests necessary to estimate the amount and degree of such failure are complicated and impractical from the standpoint of the general practitioner. This holds good except for the urine, which is easily tested and furnishes the physician with fairly accurate information regarding the patient's condition. The trouble lies not in the inaccuracy of the urinary tests, but in the perfunctory and careless manner in which they are made. The patient should be carefully instructed when and how to save the twenty-four-hour amount of urine. Up to the sixth month an examination every two weeks will suffice, but from that time to full term a weekly examination will not be any too often. In case anything abnormal be discovered in the urine, indicative of non-elimination on the part of the patient, more frequent and careful urinary examinations will be necessary. The patient should be impressed with the great importance of not only carefully carrying out the physician's orders, but also certain important symptoms, like a recurrence of nausea and vomiting, headache, and edema, should be carefully explained to her. Many women have been needlessly sacrificed because they misinterpreted these symptoms and failed to consult their physicians in time.

In the same way the patient should be carefully instructed as to the proper diet when the urine shows anything abnormal. A partial or complete milk diet will be rebelled against unless the patient understand the dangers of a heavier but more appetizing diet. If in spite of the ingestion of large quantities of water, the use of cathartics, and the increased activity of the skin, the patient shows no signs of improvement, she should be put in bed and an absolute milk diet insisted upon. In case the albumin and casts increase instead of diminishing the advisability of emptying the uterus in the interest of both mother and child must be carefully considered.

LACERATIONS OF THE GENITAL TRACT AND THEIR REPAIR.[1]

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The passage of the fetus through the parturient canal may produce lacerations of the cervix, of the vault of the vagina, the anterior, lateral, or posterior walls of the vagina, the pelvic floor, and the labia. Lacerations of the pelvic floor may extend down to but not through the sphincter ani muscle, or not only through the sphincter muscle but for a variable distance up the anterior wall of the rectum. Therefore, upon the termination of labor the genital tract should be carefully inspected with a good light, exercising rigid antiseptic precautions. Inspection is imperative, as the true extent of the traumatisms cannot be appreciated by simple digital examination.

The diagnosis of injuries to the vulva and perineum is readily made by external inspection, but the recognition of injuries to the pelvic floor, cervix, and vault of the vagina requires especial care in exposing the deeper structures. To make a thorough examination the patient must be placed upon her back or side, at the edge of the bed or on a table, the labia separated, and the pelvic floor raised for inspection. Too frequently the labia are merely separated, and if there is no evidence of a laceration at the outlet, or an external tear, the examination ends. Too frequently also lacerations of the pelvic floor only are sought for. The anterior vaginal wall should be routinely examined as to depth and extent of lacerations; for if the lacerations extending through the fascia are permitted to go unrepaired, as so frequently occurs, there will be a resulting cystocele, which until recently has proved so rebellious to operative cure.

Slight lacerations of the cervix invariably occur in primiparas, and usually heal spontaneously. These slight tears are, of course, possible avenues of infection. Extensive tears may be due to sudden stretching of the cervix, unwarranted interference on the part of the obstetrician in an endeavor to hasten dilatation of the cervix, and to operative procedures. It must be remembered that malignant disease and cicatricial tissue is a predisposing factor.

Whenever bleeding from the vagina continues, and the uterus is empty and contracted and there are no lacerations of the anterior vaginal wall to account for it, the cervix should be pulled down to the vulva, under strict asepsis, and inspected.

The cervix should be effaced and the os dilated or easily dilatable before applying forceps, otherwise lacerations of a deep and dangerous character may occur, extending into the vaginal vault, or even into the peritoneal cavity, with serious hemorrhage at the time, or a subsequent infection, or both.

It is the exception if a laceration does not occur during labor, and while every tear is an open avenue of infection, all those injuries which involve the pelvic floor and weaken its supporting power are subsequently followed by bad results.

The vulva may be torn anteriorly or laterally; if the laceration is in the vicinity of the clitoris the accompanying hemorrhage may require suture for its control. The posterior commissure and fourchette are invariably torn at the first labor. All of the traumatisms just mentioned are frequently superficial, and require only an antiseptic dressing.

Lacerations may occur in the vagina without any involvement of the perineum. Extensive rupture, however, involves both the vagina and perineum. The laceration of the external perineal surface is usually in or near the median line, and when it extends into the vagina the line of extension

[1] Read before the Northwestern Medical Society, April 1, 1907. Part of a symposium.

is usually into one or both vaginal sulci, so that the raw surface forms a partial or complete Y. When the laceration extends into the vaginal sulci the fibers of the levator ani muscle are involved, thus lessening the supporting power of this muscle, subsequently resulting in a rectocele with its consequent train of symptoms. There is a rare form of lesion known as a "central tear," caused by the child's head ploughing through the posterior vaginal wall and emerging through the skin of the perineum, without causing the rent to extend either into the rectum or vulva. Finally, it must be borne in mind that there may be a submucous rupture of the fibers of the levator ani muscle, without any external laceration. This form of injury does not produce symptoms until the woman assumes the upright position. Do not hasten to condemn the accoucheur in such cases. The treatment of this latter form of laceration belongs to gynecology rather than to obstetrics.

The causes of lacerations at the outlet are numerous. These lacerations will occur in certain cases in spite of the greatest care, but if skill is exercised these tears very frequently will be reduced to a minimum size. The cause in general of these lacerations is the disproportion in size between the passenger and the passage; but this can be frequently overcome if sufficient time be allowed for the soft parts to become distensible. Of other causes may be mentioned precipitate labors, advanced age of the patient, edema, want of elasticity in the tissues, and abnormal size of the fetal head. In some deliveries the child is directed too far backward, thus causing the head to hug too closely the posterior vaginal wall, which unduly distends the perineum as descent takes place.

Forceps delivery increases the danger of laceration if the delivery be too rapid, but if the operator may take his time the head is under such perfect control that he may extract at his leisure, thus allowing sufficient time for the necessary stretching. If there is time for careful delivery the added bulk of the blades of the forceps may be eliminated as a causative factor in injuries of the genital tract. All operative procedures as a rule predispose to laceration, because the conditions demanding such are likely to entail a rapid extraction, invariably at the expense of the maternal tissues. In delivering the head subsequent to a version, the rapid extraction necessary to save the child's life always threatens the integrity of the maternal soft parts. Too frequently after normal delivery of the head in vertex labors the attending physician considers that all risk of laceration is over, but it must be borne in mind that the posterior shoulder may rotate in such a backward direction, especially when the bisacromial diameter is large, that an extensive tear results, or what very frequently happens, the posterior shoulder renders more extensive a small rupture already produced by the passage of the head.

After the head is delivered, guide and deliver the posterior shoulder. As soon as the child has been delivered and cared for the examination of the vaginal outlet should be made.

Having determined the position and degree of lacerations of the genital tract, the question naturally arises, when shall the injuries be repaired? The time for the repair of these injuries may be divided into three periods: (1) The immediate, as soon as labor is completed, or within twelve to twenty-four hours thereof. (2) The intermediate, five to ten days after confinement. (3) The secondary, which is at any time subsequent to the termination of the puerperium.

It must be apparent to every one that the ideal method of procedure is the one which will restore the organs and structures of the parturient woman to a condition similar to what they were prior to the occurrence of her labor. When one considers the various sequels that are likely to result from failure to unite, this is still more evident. Subinvolution of the uterus and genital tract, the increased danger of infection, and the long train of symptoms that arise as secondary results

of such conditions make it extremely desirable that repair should be done as early as expedient.

Some obstetricians are advocating the intermediate, or fifth to seventh day, repair as a routine procedure. The genital tract is kept clean, to avoid as much as possible infection through the open avenues afforded by the injuries, until the fifth to the seventh day, when all lacerations of the genital tract, including the cervix, are sutured. However, I am skeptical as to the ultimate value of this intermediate repair. If primary healing is not satisfactory, the results of secondary operation are so good that to break into a woman's early convalescence and upset the general household on the fifth to the seventh day of the puerperium, by giving her ether and subjecting her to an operation, at a time when the milk secretion is fairly established and the baby is nursing well, is not justified by the surgical exigencies of the case. The wealthy and well-to-do will remain in bed the extra length of time incident to the intermediate repair, and so will patients under hospital care. But as the vast number of labors in this and all countries occur in private houses, and as in many instances it is essential that the parturient should leave her bed as early as consistent, and as a large number of women are so situated that they cannot receive the services of skilled assistance, the surroundings of the patient, the ability to receive efficient nursing, etc., must all be borne in mind, and as a consequence we must consider these operations from the standpoint of the conditions under which they will usually be performed.

Personally I prefer immediate repair of the lacerations incident to labor irrespective of their degree or extent, unless the patient is too exhausted, the physician tired out by too long attendance on the case, there is poor light, insufficient help, or the necessary instruments or suture materials are not available. In such instances twelve to twenty-four hours may be allowed to elapse, when all repair can be efficiently accomplished.

If the physician in attendance is unable to execute this work properly, he should not hesitate to call in one who is capable of doing so.

My practice in cases of cervical lacerations is to ignore the cervix, except when there is profuse hemorrhage from the lacerations, or in those cases in which it was necessary to make multiple incisions in the cervix. I think, in so far as the cervix is concerned, if the lacerations do not unite spontaneously better results are obtained by the secondary operation.

If the lacerations of the anterior segment of the pelvic floor are slight do not interfere. If, however, they are of considerable extent, the important fascia of the pelvis will be torn, and prolapse and dislocation of the bladder, urethra, and anterior vaginal wall will occur. The primary closure of such injuries gives satisfactory results, precautions being exercised to approximate the torn edges of the fascia. When extensive lacerations high up occur, it is often impossible to close the entire laceration accurately and completely.

If the tear in the posterior segment of the pelvic floor be considerable and the condition of the patient bad, the operator may wisely delay repair for twelve to twenty-four hours. The most important suture in closing lacerations of the pelvic floor are those that coaptate the torn levator ani and transversus perinei muscles.

In the introduction of sutures in the pelvic floor, the so-called "inside" sutures begin above toward the cervix and work out toward the vaginal outlet; in repairing the perineum the so-called "outside" sutures begin nearest the anus and proceed up to the point where the posterior vaginal wall begins. These latter sutures should bring together the skin edges and underlying fascia, taking a good hold of tissue, but without tension. The results following these operations are usually very good. When the pelvic floor alone is lacerated, sutures may be introduced previous to the delivery of the placenta, but not tied until after the placenta is delivered. In this way a great deal of time is saved and the

temptation to hasty expression of the placenta is diminished. In complete tears the rectum should first be closed by a continuous suture, the stitches inserted into connective tissue, turning the rectal mucosa into the bowel. The fascia and sphincter ani muscle should then be accurately closed, and then the pelvic floor and perineum, as in an incomplete tear. Operations for complete tears in the hands of all operators are not so satisfactory as those for the incomplete variety, a large percentage failing to heal by first intention. In the case of a complete or partial failure, a secondary operation is indicated before the patient is discharged from treatment.

For suture material twenty-day chromicized catgut is used throughout. Size No. 1 is sufficiently strong. No. 0 is used for buried sutures. If in the opinion of the operator the tension on the perineal sutures is too great, this may be diminished by the introduction of one or two silkworm-gut sutures.

Mercuric chloride need not be stronger than 1:4000, and lysol one per cent. Salt solution acts very nicely upon mucous membranes.

Dusting powders are not necessary, and when used do no good.

The after-treatment of these patients consists in strict regard to surgical cleanliness so applied as to disturb least the tissues and parts which are healing. The use of the catheter should be limited to the second day, even in most extensive cases. Whether the tear is complete or incomplete, the bowels should be moved at the end of forty-eight hours.

It is an interesting observation, repeatedly made, that puerperal infection may develop while wounds in the perineum and pelvic floor heal by primary union.

THE DEVELOPMENT OF OCCULT FINGER-PRINTS.

BY ROBERT L. PITFIELD, M.D., PHILADELPHIA.

The study of finger-prints made by bloody, dirty, or paint-smeared fingers on paper or glass is of great interest and value in medicolegal matters. But criminal fingers are not always conveniently inked with blood or paint. It occurred to me that perchance there was enough fat in the finger-prints of normal hands on glass, paper, etc., which, on development like a photograph, would reveal the impression of the finger. Accordingly I first rubbed my thumb with a little butter, making it slightly greasy; then I printed my thumb on a piece of glass, leaving a scarcely visible, greasy smear, such as often befogs eyeglasses. After exposing this smear or print to the fumes of osmic acid, the fat became as black as printer's ink, and all of the concentric lines could be seen as easily as if ink had been used.

Next, the normal secretions of a clean thumb were tried: here the grease print was very faint and indistinct, but all grease had been washed away with soap. On rubbing my thumb on my nose it became sufficiently greasy to print a very distinct mark, which became very black and sharp, revealing the concentric lines perfectly.

By this means greasy finger-marks on glass, paint, or paper may be made to reveal their occult design. In grease prints on paper, the grease is apt to be absorbed by the paper and the print become a mere grease spot; to obviate this freshly fingered paper should be kept on ice until exposed to osmic acid. Animal oils are more easily blackened than others. Mineral oils are but slightly susceptible to osmic acid.

If hands are not frequently washed there is enough sebaceous material on them to make faint prints after twelve hours' exposure of the prints to osmic acid.

It is possible to preserve prints by floating celloidin over them and hardening this with chloroform, then covering with varnish or with Canada balsam and coverglasses.

HOT AND COLD APPLICATIONS IN MEDICINE.

BY A. E. BLACKBURN, M.D.,

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Heat and cold are employed for such a number of conditions and in such a variety of ways that in this discussion it is not possible to do more than consider briefly their physiological action and the general principles of their application.

Heat and cold are not two distinct forces, but rather relative strengths of the same force, namely, caloric.

We use the term cold relatively, as it is the point at which there is no sensible heat, and this is estimated to be several hundred degrees below the zero point. By using the term cold we mean something that abstracts heat from the body; by the term heat we mean something that communicates heat to the body.

The lower animals are much less susceptible to this force than the human being. Their outside covering prevents the radiation of body heat, and also conducts heat and cold poorly. In the human being the subcutaneous tissue prevents the radiation of body heat, and we adjust our clothing in conformity to external influences.

PHYSIOLOGIC EFFECT OF HEAT.

Nervous System.—The effect of heat on the nervous system is first that of a transitory excitant followed by a sedative and depressing action, as is seen in relief of painful parts. Immersion of the whole body for a long period of time in warm water produces muscular weakness, languor, nervous depression, drowsiness, and finally convulsions and coma, the brain and nervous system becoming profoundly anemic.

Heart and Circulation.—The application of heat accelerates the heart action in direct proportion to the amount of dilatation of the superficial blood-vessels.

Respirations.—The respirations are at first increased, but later slowed.

Secretion and Excretion.—The secretions of the kidneys and salivary, sudorific, and intestinal glands are all increased. Heat lowers the muscular tone of the intestines and tends to constipation.

PHYSIOLOGIC ACTION OF COLD.

The first action of cold when applied either locally or generally to the surface is to cause a congestion of the superficial vessels, which is very soon followed by an extreme contraction of the parts, with a lowering of the surface temperature and hence the general temperature of the body. If the functions are good and the exposure has been moderate in amount, there is a reaction followed by a redilatation of the capillaries, increased circulation, and restored heat. In asthenic individuals the reaction is slow and sometimes does not follow. Prolonged exposure produces local and general syncope and devitalization. Beyond this point we have only the chemical action of the tissues.

Cold is used in medicine with two primary objects in view: First for its primary and secondary physiological effect on the nervous system, blood-vessels, and cells of the body; and secondly, for the absorption of heat. It is antispasmodic, anodyne, and anesthetic.

Schweinburg says: "The public to be sure believes the change from warm to cold treatment a basic difference, and yet this is only one of method and form." Braun (Balneotherapie, Berlin, 1868) says: "Cold refreshes by stimulating the functions, warmth by lessening their work physically; and in this sentence the most important practical difference is ex-

pressed." After reviewing further the action of hot and cold baths, he states: "The most general practical maxim is that the cold-water cure presupposes a certain integrity of the organic functions and a certain degree of productive ability, while the warm-water cure does not make so pronounced a demand on the inherent forced activity of the organism."

Some of the common conditions in which general hot baths are used are acute and chronic poisonings and intoxications, dyscrasias of various kinds, nephritis, gout, rheumatic and arthritic conditions, skin diseases, eruptive diseases, chorea, convulsions, insomnia, cardiac diseases, collapse, and acute colds. Some of the local conditions in which hot baths, either local or general, are used are myalgia, neuralgia, gall-stone colic, nephritic colic, meningitis, intestinal colic, pneumonia, pleurisy. Cold may be applied for many of the above states at the dictation of the physician; more especially is it employed for its antipyretic effect in the acute febrile conditions.

Hot baths may be Turkish, Russian, sponge, pack, hot dry air, hot moist air, as used in the different watering-places in this country and abroad. Locally we can use, in addition to the above, mud, sand, salt, fango, and electric baths.

Cold is usually applied as cold sponge or plunge baths, ice-pack, ice-cap, Leiter's coil, and by enema. There has been much discussion as to the benefits obtained from general and local baths. Hyde states that after twenty-five years' experience he is convinced that much harm is done by Turkish, Russian, and other hot baths, and warns especially against being deceived by a temporary improvement, which is followed by an aggravated state due to overstimulation. He advises strongly in favor of local treatment. Hauffe urges strongly in favor of local baths, claiming the general effects are as good as in the general bath. It is well established that local baths induce general perspiration, which effect is more pronounced if the unimmersed parts are lightly covered.

The Tallerman apparatus or some modification is the one mostly used in this country for local application of dry heat. It consists of a copper cylinder which is filled with dry air obtained from the burning of gas or oil, or heated by electricity. It may be made large enough to encompass practically the whole body. The temperature can be raised to two hundred and fifty to three hundred and fifty degrees. It is especially adapted to subacute or chronic conditions following disease or injury and in myalgias generally.

The very great benefit obtained by patients at various watering-places both at home and abroad depends upon several causes—hydrotherapy, diet, exercise, accessories.

Hydrotherapy.—The skin being the largest organ of the body excretes toxins the retention of which is harmful to the organism, and the effect of water affects the power that it possesses through its nerve endings to stimulate distant organs and tissues. The laity commonly believe and the profession do not sufficiently emphasize the fact that it is not the mineral constituents contained in the water that is drank and used in bathing that proves beneficial, but rather the excellent method by which it is applied by trained assistants. As a matter of fact, the less mineral matter contained in water, the better both for bathing and drinking.

Diet.—In this country especially there is great room for improvement. Luxurious hotels are present in which the gouty or rheumatic patient is confronted with a menu which is exceedingly tempting, but in which it is difficult for him to obtain what he most needs. It would certainly be a step in advance if some of these springs were so controlled that they would be available to the medium and poorer classes.

Exercise.—When under new surroundings patients are willing to undergo regular and systematic exercise, which they would not do at their homes.

Accessories.—Under these we have the

various forms of massage and electrical treatment, which add greatly to the benefit obtained in certain conditions.

Cold is used for the subsequent exhilarating effects, which may be increased by brisk rubbing. A cold plunge or shower on rising, for those who react promptly, is a good tonic and prevents catching cold. After exercise a cold shower followed by a brisk rub prevents muscle soreness. Cold sea bathing, if moderate in length, is stimulating, but is very apt to be prolonged to the point of depression.

Cold baths, either plunges or sponges, or pack, are employed in acute febrile diseases and especially in typhoid. The following effects are noticed: reduction of temperature, improvement of the nervous symptoms, strengthening of the circulation and respiration, and increased kidney secretion. Vogel's statistics of typhoid fever in the military hospital of Munich covering a period of fifty years show a reduction of mortality to two and seven hundredths per cent by the cold-bath treatment as compared with twenty per cent by other methods. There are certain instances of high temperature, cold and cyanosed extremities, in which I have found a hot mustard foot-bath to equalize the circulation, accomplish the same results, and be especially grateful to the patient.

FORMIC ALDEHYDE DISINFECTION BY MEANS OF POTASSIUM PERMANGANATE.[1]

BY E. M. HOUGHTON, PH.C., M.D., AND L. T. CLARK, B.S.

Formic aldehyde has been recognized for several years as the most efficient germicide available for disinfecting closed rooms and apartments. Some difficulty has been encountered in devising a safe, economical, and equally effective method for liberating the gas from its liquid or solid state, that would do away with the necessity for expensive apparatus and an experienced operator.

Various means have been employed for liberating the gas from saturated aqueous solutions of formaldehyde and from its dry polymeric form, paraform. The following methods have been the most extensively used: Autoclave under pressure; retort without pressure; generator or lamp; formaldehyde and dry heat in partial vacuum; sheet spraying; and heating paraform. These several ways have their respective good qualities as well as their objectionable features. The autoclave under pressure and retort without pressure are perhaps the most commonly used and rank among the first in efficiency, but they also have serious deficiencies, requiring (1) an expensive apparatus, (2) outside heat, (3) an experienced operator.

In January, 1904, Dr. G. F. Johnson, of Sioux City, Iowa, read a paper at a meeting of the Sioux Valley Medical Association, in which he described a new means for liberating formic aldehyde from its solution for purposes of disinfection. This method, conveniently called "the formalin-permanganate method," differs from others quite materially, as no outside heat is required. It consists in adding potassium permanganate crystals to full-strength formaldehyde solution in a convenient receptacle placed in the center of the room to be disinfected. Various proportions of permanganate and formaldehyde have been employed, but McClintic, of the Department of Public Health and Marine Hospital Service, as the result of an elaborate series of experiments, has recently reported that the best results are obtained when fifty grammes of potassium permanganate are brought in contact with one hundred cubic centimeters of formaldehyde, or multiples

[1]Read before the Sanitary Science Section of the Michigan Academy of Science, at Ann Arbor, March 28, 1907.

of these quantities, depending upon the space to be disinfected. Within a few seconds to one minute, depending upon the size of crystals used and the temperature of the room, a vigorous reaction ensues, causing strong ebullition of the liquid and producing sufficient heat to liberate a large volume of formic aldehyde gas and water vapor. This boiling continues from four to six minutes, becomes less vigorous, and gradually recedes until nothing remains except the nearly dry residue. In many of our trials it became thoroughly dry. In the majority of cases, however, this residue consisted of a lower oxide of manganese, a very small amount of formaldehyde, carbon dioxide, potassium hydrate, and some moisture. According to McClintic, the liberation of the gas and water vapor is brought about according to the following reaction: $-4KMnO_4+3HCOH+H_2O=4MnO(OH)_2+2K_2CO_3+CO_2(CO_2)$, the heat produced causing the liberation of formic aldehyde and water vapor. Contrary to the general belief, the amount of formic aldehyde destroyed is very small, as McClintic showed that the amount of gas in his test rooms was substantially the same as where an equivalent amount of the disinfectant was liberated by the autoclave, etc.

The following figures obtained from some of our experiments and from Dr. McClintic's results will convey a good idea of the exact amount of formaldehyde absorbed in the reaction and that liberated as gas. Computing from Dr. McClintic's formula, we find the amount of formaldehyde necessary to cause a complete reaction in the permanganate taken, by using the following equation:

$4KMnO_4 : 3HCOH ::$ weight of permanganate used : X, or $628 : 90 :: 240 : X$.

X=34 grammes formaldehyde used—that is, 85 Cc. of the formaldehyde would be used in the reaction, and the remainder, 395 Cc., would be driven off into the room.

To verify these results we made trial experiments and weighed the material before and after the reaction.

Weight of formaldehyde	510	grammes.
Weight of pail	992	grammes.
Weight of briquettes	281	grammes.
Total	1783	grammes.
Weight of pail and residue after reaction	1432	grammes.
	351	grammes.
Weight of moisture in residue	43	grammes.
	394	grammes.

Thus accounting for all but one gramme of material that would be driven off, as shown by Dr. McClintic's formula.

Practically it is found that in the ordinary commercial 40-per-cent formic aldehyde solution 38 per cent is available by the autoclave method, while with this method we can expect 33⅓ per cent, which does not differ greatly from the other; and even this apparent advantage in the autoclave method is more than counterbalanced by the very rapid liberation of the gas, which makes for very thorough disinfection, the end sought by sanitarians.

The public is becoming more thoroughly enlightened as to the necessity of disinfection, and health boards are demanding that the most efficient sanitary precautions shall be taken to limit the spread of the infectious diseases. Nothing has been discovered that will satisfactorily take the place of formic aldehyde, hence there is a crying demand for a more simple, practical, and efficient means of rendering the disinfectant available, and the formalin-permanganate method should win a place for itself.

Some preliminary experiments, carried out to determine the merits or demerits of this new method as applied to disinfection in a practical way, verified the results obtained by the Department of Public Health and Marine Hospital Service in their experiments to determine the best means of disinfecting railroad coaches. During the progress of our experiments it was found that when potassium permanganate crystals were added to formaldehyde in the above named proportions, in quantities sufficient to disinfect the ordinary sized living room, very violent ebullition and foaming oc-

curred, causing the material to boil over the sides of the receptacle. In our trials 240 grammes of potassium permanganate crystals were placed in an ordinary three-gallon pail and 480 Cc., one pint, of 40-per-cent formaldehyde was poured upon them, these quantities being sufficient to disinfect 1600 cubic feet of space.

As the spattering and foaming over the rim of the pail caused by such violent ebullition were, to say the least, very objectionable, measures were adopted to retard the reaction sufficiently to avoid this difficulty. After trying several series of experiments the desired result was successfully accomplished by incorporating with the potassium permanganate crystals 15 per cent of Portland cement and enough water to give the mixture the proper consistency for forming into small briquettes. After making, these briquettes are left until dry, when they can be readily handled.

With the potassium permanganate crystals in this compact form, the method becomes very simple and easy of operation. The charge, 480 Cc. of formaldehyde, is poured into a three-gallon metal pail, and the three briquettes containing 240 grammes of potassium permanganate crystals are quickly dropped into the liquid. The reaction ensues more slowly and with less violence than when the crystals alone are used, and is not accompanied by any undesirable foaming or spattering.

In conclusion we believe the following summary may be made:

1. Formic-aldehyde disinfection is simply and quickly accomplished by means of the permanganate briquettes.

2. No expensive apparatus is necessary, and no outside heat is employed, thus lessening the danger of fire.

3. More thorough disinfection is accomplished, because the whole volume of gas and moisture is liberated during a very short time.

A FEW PRACTICAL POINTS ON INFANT FEEDING.[1]

BY SAMUEL A. VISANSKA, PH.G., M.D., ATLANTA, GA.,

Visiting Physician to Home for Incurables and Physician-in-charge of Children's Dispensary of the Woman's Board of City Missions.

Six years ago when this association met at Augusta I read my first paper before it on the subject of infant feeding. My object in continuing this subject now is to tell you whether the results of my experience have been satisfactory or not, in order that, in this way, we may come to some conclusion as to what method we shall adopt.

Sometimes some of us boil over with enthusiasm on a subject or method, read a paper regarding it, and the members of the association must ofttimes wonder if the doctor is carrying out his same ideas or if his practical application of them has caused him to make changes in his original theories.

With so important a subject as infant feeding—a subject which has always baffled our skill and which must always continue to do so—we cannot deal too often or discuss it too freely. Experience has taught us that there are but two ways of feeding an infant, namely, either on human milk at the breast of a mother or wet-nurse, or upon an artificially prepared milk diet; hence we have the two corresponding classes of the breast-fed and the bottle-fed baby. It goes without saying that the breast-fed are as a rule a happier, healthier, and larger lot than the bottle-fed, and that the mortality of the former is far less than that of the latter. The most careful preparation cannot possibly make the milk of another animal chemically identical with that of a woman, or similar in its effects on the

[1]Read before the Medical Association of Georgia, April 17, 1907.

child; therefore it is the solemn duty of every healthy mother to nurse her infant, and it is still further the duty of the attending physician to see that this method is carried out.

The question, then, might well be asked, Why are so many infants fed otherwise? I am inclined to believe that physicians as a rule (there are exceptions to all rules) do not give this most important part of their duty enough time, thought, or attention, especially in the case of the primipara.

How many of us think of preparing the breasts for our little visitor, rather trusting to nature to do that? But how often do we find nature requiring just a little assistance! It does not need much, and a little time spent here will lessen the death-rate and bring joy and happiness to many a parent. Physicians do, or should, examine the urine before labor; they sometimes determine the position of the child, but do they examine the breasts to see what the outlook for nourishment is? The most important point here is to prepare the nipples, and this should begin at least two months before the expected time. Teach the mother how to pull the nipples out and give some slightly astringent solution to toughen the nipples somewhat for the suction force to be made by the infant. I prefer a solution of alum and distilled extract of witch-hazel. Sometimes you will find that while the fingers will pull the nipples out into good shape, as soon as the breasts begin to enlarge and secrete milk the nipples seem to shrink or rather become inverted, and are not long enough for the baby to take hold. Then you are "up against it," and it will require a great amount of patience on the part of the mother, nurse, and doctor to overcome this. It is right here that a great number of infants get a bad start. The baby frets, and the first thing you know a nipple already "developed" is ordered from the drug store, and the little one is placed on one of the artificial foods. This trouble can be overcome in most cases by the use of a Yale breast pump. It not only stimulates the secretion of milk, but it draws the nipple out, and by placing the baby to the breast immediately it has little trouble in nursing. This process might be repeated each time for several days. You can vary the amount of suction force by moving the pump up and down. It works in the same way as a bicycle pump, and it does not get out of order nearly as quickly as does the old-style breast-pump.

Another important point is the diet of the mother just before and after labor. This should consist of easily digested food, chiefly liquid nourishment or semisolids; no heavy foods such as pork, cabbage, turnip greens, pastries, etc., should be given. Especially after labor it is safe to give only such foods as gruel, soup, soft eggs, toast, and tea drawn with milk instead of water, all of which will usually produce sufficient stimulation to the mammary glands. The malt preparations might be good in a few cases in which the milk is scanty, but I am inclined to believe that their use has been overestimated.

Sometimes we find that infants do not thrive even on breast milk, and we should be able to tell whether the fault lies with the fats or proteids. This can easily be determined by the use of Holt's lactometer and cream gauge.

In regard to wet-nursing, it is only in the extreme cases that I suggest this course of feeding, as experience has taught me that there are many objections to a wet-nurse, and, indeed, in this part of the country it is often impossible to find a suitable one.

Artificial Feeding.—By conscientious work on the part of the chemist and physician the artificial feeding of infants has become almost a science. By chemical analysis we know the composition of mother's milk and of cow's milk, while by actual experience we have found that it is the casein in cow's milk which is difficult to digest, and now by the "percentage feeding," known also as the "American method," the difficulty formerly experienced has been made easy.

As I stated in my former article, we must

have a sort of starting-point and then modify to suit each individual case, as you will find every infant a law unto itself.

The infant's stomach has certainly been a great experiment station, but even this is no longer necessary.

The method of Professor Seibert, that of feeding by weight and not by the age of the child, has been carried out by me for years, with most excellent results, and I "stand pat" on this method.

There is good reason for this: a large child requires more food than a small one, just as a large horse requires more food than a small horse, and it is on this principle that we should feed infants. To illustrate: A baby at the age of three months might weigh eighteen pounds, while the average weight is only twelve and three-quarter pounds. If you were to direct the preparation for the three-months-old baby according to its age, the formula would be for a baby weighing 12¼ pounds, and therefore 5¾ pounds of the baby would be insufficiently nourished. On the other hand, a child at the age of three months weighing eighteen pounds can be placed on the same formula as the average baby of eight months weighing eighteen pounds.

It is during the summer months, when the difficult cases come in, that this method of weight will serve you. For example, a case of marasmus is brought in, and upon inquiry you learn that for the past month or so the different foods were given, but in some way the baby lost weight, and it is now almost a skeleton, with wrinkled face and almost a continuous whine, looking at least eighty years old. You ask the age: "Eleven months;" the weight, "Ten and a half pounds;" and, gentlemen, if you were to direct the food according to age it would never agree with it. Instead, what do we do? We give it not only the same percentage of fats and proteids and sugar as we would a normal baby at two months, but also the same quantity of milk.

Modified cow's milk is the ideal food for infants, but it requires some experience and judgment to know when to begin the milk after leaving it off. In "summer complaints," for instance, I never allow a drop of milk to pass the infant's lips, but am guided entirely by the condition of the infant's stomach and the character of the stools. The important point I wish to make here is this: An infant is brought to you with a gastroenteric trouble, a history of having tried first one food, then another, and the question is what to do. I begin by taking away all food except sterile or barley water, treat the disease, and then place the baby on modified milk according to its weight. As a rule this agrees with the little one, and all goes well for a week or two, when for some reason the stools change in character and frequency, and in cases not understood you might think it was the preparation that was at fault, but this is usually not the case. There might have been an infection from the milk supply or carelessness in cleaning the bottles and nipples. Then, again, infants are "all liver;" so we would take the baby off the milk, cleanse it out thoroughly for a day or two, and instead of changing the food or even the formula begin with it again. This course might have to be repeated several times during the heated term.

It is a bad practice to give sterilized milk for too long a period for fear of producing scurvy, and my practice is as follows: Sterilize during the summer, pasteurize in the spring and fall, and give raw milk during the winter months. During the period of sterilization it might be well to give a little orange juice, and by close observation you can easily prevent scurvy. I have yet to see a case among my patients.

Of course it is necessary to have a rigid milk inspection in all cities. On this latter point too much cannot be said, but I trust I have outlined a way in which infants can be properly fed and their health preserved even under the present insufficient sanitation of the general milk supply.

AN EFFECTIVE FORMULA FOR CATARRHAL CHOLANGITIS AND ITS CONGENERS.

BY CHARLES GILBERT DAVIS, M.D., CHICAGO., ILL.

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For a number of years I have been especially interested in the medical treatment of diseases of the liver and gall-bladder, and while the surgical literature upon the subject of gall-stones is voluminous, not so much has been written upon the purely medical treatment of such conditions.

Twenty-five years ago I began the use of salicylic acid in various pathologic conditions of the liver, and have ever since made use of this drug with satisfactory results. I have found it very satisfactory, particularly in combination with certain other drugs, as a cholagogue and antiseptic whose effect is prolonged throughout the alimentary tract. In catarrhal cholangitis, with and without the formation of concretions, I have had the best of results from the use of the following formula:

Phenolphthalein, ⅛ grain;
Acid sodium oleate, 1 grain;
Salicylic acid, pure, 1½ grains;
Menthol, 1 grain.
Mix and make one pill.

I believe that many cases ordinarily considered amenable only to surgical intervention can be satisfactorily treated at the patient's home by the use of this formula. My experience with it has been so satisfactory, not only in the cases cited in this paper, but in others, that I am earnestly of the belief that ultimately cholangitis, with and without formation of stones, will cease to be a surgical condition, and will be amenable to satisfactory treatment through the application of such a formula as the one above referred to.

There are, however, certain things to be considered in connection with this formula, as, for instance, the salicylic acid should be the "true" acid, obtained from natural sources, and not the synthetic sort. The acid sodium oleate should be prepared with a great deal of care. Both of these medicaments are excreted by the epithelial cells lining the bile-ducts and materially assist in disinfecting the tract.

In all of my work I have made use of this formula, as manufactured by a prominent American house, who have prepared it in the shape of a pill, approximately five grains in size, covered with a thin, pink-colored sugar coating. The mass of this pill is quite soft and very easily dissolved in the stomach. The combination I have found very satisfactory, not as a purgative pill, but more as a cholagogue, concretion solvent, and biliary disinfectant. The menthol and phenolphthalein act by producing and regulating intestinal activity. The salicylic and oleic acids have a decided antiseptic action, the oleic acid also acting as a powerful cholagogue. Perhaps the relation of several cases recently occurring in my practice will be of sufficient interest as illustrating the class of cases in which I have found this formula to be of the greatest service.

CASE I.—Mrs. C., aged forty-four years, married, housewife, consulted me on April 26, 1906, stating that for several years she had been subject to intermittent attacks of indigestion. These had gradually increased in frequency and intensity. Recently her attacks had recurred about every ten days. When she called me she was suffering pain in the epigastrium, the attack being ushered in by a slight chill, followed by a rise in temperature, 102° F. I was called to attend the patient during one of these attacks, and found her skin discolored, eyes slightly jaundiced. Patient was vomiting; bowels constipated; liver congested and enlarged. On the history and examination I considered the case one of catarrhal jaundice.

I first gave small doses of calomel to free the overloaded intestines, and then directed the patient to take two of the special pills two hours after each meal, followed by copious draughts of hot water. The treatment was continued for a month, varying the dose occasionally. Her present attack was promptly amenable to the treatment, and since that time she has had no returns. Her condition is greatly improved and the jaundice has disappeared. Patient herself comments upon her sense of well-being.

CASE II.—Mr. S., aged forty-one, stock-broker by occupation, consulted me on November 9, 1906, giving the following history, which is interesting, since it shows a strong hereditary tendency to gall-stones: His mother died from an operation for gall-stones. His sister died of sepsis following an attack of gall-stones. Patient has had attacks of colic for two years, growing gradually more frequent and severe. Two prominent physicians had advised immediate operation. Patient is sallow, tongue heavily coated, breath fetid. Constant emesis. Tenderness over epigastrium and under shoulder-blade.

Diagnosis of gall-stones was made, but before advising operation I decided to try my formula. I gave two of the pills two hours after each meal-time, followed by a good-sized drink of hot water. For some weeks the attacks continued, but they began to grow lighter. The treatment was continued without intermission. At the present time he has had no return of the attacks since January 10, 1907. He is still under treatment, taking two pills at bed-time. I consider that this patient has made remarkable improvement under the treatment.

CASE III.—On January 21, 1907, I was called by Miss S., aged nineteen years, single, stenographer by occupation. Family history good. Complains of indigestion. Food distresses her soon after eating. Suffers about every two weeks from an attack of chills, followed by fever and vomiting. Constipation. Patient very fleshy, skin sallow and discolored. Eyes slightly jaundiced.

The diagnosis made was catarrhal cholangitis, and treatment consisted of the administration of two pills every night and morning, followed by large quantities of hot water. The bowels remaining constipated, two more pills were ordered two hours after each meal, making in all ten pills a day. Immediate improvement was noticed. The treatment has been continued irregularly ever since, and there has been no return of the attacks. Patient's condition is very much improved in every respect.

CASE IV.—Mrs. G., aged fifty-two years, married, housewife, consulted me on December 20, 1906, stating that she has suffered for two years from gall-stone attacks occurring irregularly about every three to four weeks. She complains of constant soreness in the hepatic region, and tenderness over the gall-bladder. She is weak and listless and has no appetite. Tongue is heavily coated, bowels constipated, skin yellow, and eyes decidedly jaundiced.

Diagnosis was gall-stones, and two pills were given night and morning, followed by a glass of hot water. Improvement not being noticed, the number of pills given daily was increased from time to time as the condition of the patient indicated. The attacks have grown less frequent and of much shorter duration. For the past six weeks patient has had no trouble and is feeling very much better. She is still under treatment, but continues to improve progressively.

CASE V.—Mr. G. L., aged thirty-five years, single, stock-broker, consulted me on November 30, 1906, stating that for six months he has been failing steadily in health. Complains of pain in the epigastrium and back. Vomits frequently. Has occasional chills and fever. His appetite is gone. His food distresses him. He has lost weight. He states that he has been treated for gastric ulcer, tuberculosis, and Bright's disease. His skin is yellow. Urinalysis shows slight trace of albumin, no casts. Bowels are alternately constipated and very loose. The skin is decidedly yellow.

Diagnosis of catarrhal cholangitis was made. My regular treatment, two pills night and morning, with a pill after each meal, followed by copious draughts of hot water, has been administered, with occasional intermissions, for four months. There has been steady improvement in all of the symptoms. Patient has gained twenty pounds in weight and feels much better in every way. Is still under treatment, but improving steadily.

CASE VI.—Mrs. G. S., aged forty-four years, married, housewife, consulted me on March 6, 1907, stating that for several years she has had stomach trouble. Has had general poor health. There has been a progressive loss of flesh. Several physicians have treated her for nervous prostration. She complains of indigestion, flatulency, and eructations of food; occasionally vomits. Has severe headaches, with pain under right shoulder-blade. Bowels are constipated. She has recurrent attacks of indigestion; tongue coated; eyes yellow. She is very thin, and there is tenderness over the gall-bladder.

Diagnosis was catarrhal cholangitis. The special pill has been administered for a month, first with two and then three pills a day, followed by plenty of hot water. There has been general improvement in the patient's condition. Bowels are now regular, appetite is good, and she digests her food well. Has gained six pounds in weight and feels much better in every way.

The formula of the pill given earlier in this article seems to warrant the statement that its administration will be of value in such conditions as cholangitis, cholecystitis, and cholelithiasis, conditions of bile stasis, either with or without the formation of concretions, and my experience bears out this theoretical conclusion.

I take pains to insist upon regulation of the food, although I do not restrict the diet too closely, simply interdicting all foods known to be difficult of digestion and all alcoholic beverages. One principal point to be carefully followed in the administration of this formula is to insist that large draughts of hot water shall be taken with the pill, for the purpose of diluting the excretions and assisting in the breaking up of any concretions that may be present.

CANCER OF THE LIP—RADICAL OPERATION.

The removal of all lymph glands which bear anatomical relation to the lip is recommended by ARMKNECHT (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv), who bases his article on anatomic and clinical studies.

Anatomically, we find a close communication between the lymph vessels of the lip and the corresponding vessels on the opposite side. There is, further, communication with the submental and submaxillary glands and with the glands along the great vessels of the neck. The lymph circulation of the tongue is closely connected with the supraclavicular glands, and these may be affected when higher groups are still free. The author, following Professor Heidenhain, advises the following technique in all operations for cancer of the lip:

The lymph glands of the submaxillary region are first removed, by means of a long incision, the facial artery and vein being ligated and freed, and the submaxillary salivary gland separated from surrounding structures and removed with its duct. A second incision along the sternomastoid is made for the removal of the cervical glands, especially those following the course of the jugular vein. A third incision follows for the removal of the submental chain. The operation is extended as far as enlarged glands are found. After all possibly infected glands have been removed, the incisions are closed, and a firm dressing is applied. The cancer itself is then removed by a large square cut, followed by an appropriate plastic operation. It is important that the dressing on the neck should be tightly applied, as otherwise the skin flap is likely to separate from the underlying tissues.

Cases operated on by the above method show over 75 per cent of recoveries.

EDITORIAL.

THE NECESSITY FOR WIDE-SPREAD PREVENTIVE MEASURES IN THE STRUGGLE WITH DISEASE.

The science of bacteriology which in its earliest stages seemed far removed from any useful purpose has, as we all know, within the last three decades, not only revolutionized our conceptions of disease and our methods of medical and surgical treatment, and in this way saved innumerable lives, but it has also magnified the importance of hygiene and preventive medicine. It is daily saving more lives by arresting the spread of disease than could possibly be saved by skilful remedial measures. Further than this, the laity are becoming better educated in the knowledge of the relationship between bacteria and most of the diseases which affect human beings and animals, and are lending their aid to medical men with the same ends in view. It is one of the encouraging signs of the times that legislative bodies, both great and minor, at the present time are voting very large sums of money to be expended by competent persons to arrest all sorts of infectious maladies, and these efforts are not only crowned with success, but they are also discovering a host of sources of infection which heretofore have been unknown or imperfectly recognized. The daily papers and medical journals teem with reports of such discoveries.

In a recent issue of the *New York Medical Record* we find a statement that the Bacteriological Laboratory of the Boston Health Department has made a report showing that most of the shell-fish taken from New England waters are likely to be contaminated with sewage organisms. Clams taken along the coast from Digby, N. S., to the shoulder of Cape Cod, with only one exception, were found to be contaminated, and it is further pointed out that while in some instances cooking may destroy the organisms themselves, this process may nevertheless fail to destroy toxic materials which have a similar origin. The same issue of this journal also contains the report that an investigation on the part of the State Commission on Tuberculosis in Animals in the State of New Jersey has revealed the fact that about 40 per cent of the milch cows in the State of New Jersey are tuberculous, and furthermore, that in order to help the crusade against this disease and to lead farmers to report sick animals to the Commission, an arrangement has been made by which the full value of all animals killed by the Commission when suffering from tuberculosis is to be paid to the owner. That some such just measure is exceedingly influential and wise is proved by another item in the same journal, in which we are told that a meeting of 300 farmers, of Rhode Island and Massachusetts, was recently held in Swansea to protest against the proposed application of the tuberculin test to the herds in the neighborhood of Fall River, the Board of Health of Fall River having suggested to the State Board of Health of Massachusetts that such a test would be advantageous.

On a recent trip made by the editor of this journal to a large town in the State of New Jersey he learned that the drainage of that town was poured into a stream which a few miles below was used by a very large number of growers of celebrated oysters for the so-called fattening of the oysters; thousands of the oysters also being grown where this stream empties into the Delaware Bay. As these oysters are shipped hundreds of miles from where they are grown it is quite possible that typhoid infection is widely spread, although its origin in many cases may seem obscure; and it is manifest that the State Board of Health in New Jersey would do wisely, not only for its own population, but for people in general, if it would insist upon a proper disposal of the sewage which we have spoken of.

Finally, we read in the *Boston Medical*

and Surgical Journal of April 4 of an interesting investigation carried on by the State Board of Health of Massachusetts in regard to health conditions in industrial life. This investigation reveals the most extraordinary amount of filth in bakeries, where the workmen who are employed not only breathe an atmosphere exceedingly foul, but where it is not uncommon to find that the baking is carried on in rooms which also contain water-closets. Indeed, in one city two-fifths of the bake-rooms showed conditions thoroughly bad in every respect, and half of the bake-rooms actually contained, or directly communicated with, water-closets. It is also pointed out that not infrequently that part of the bake-shop which is seen by customers is attractive, but that part in which the bread is made is foul. Thus, in one instance, although the shop was handsomely adorned and tastefully decorated, the bakery back of it had a broken ceiling and a dirty floor, in the cracks of which was much accumulated dirt. Around the sink from which the water was obtained the dirt was especially noticeable. The room was badly lighted, and a trap-door led to a cellar in which foodstuffs were stored, and which also contained various kinds of dirt and the foulest of water-closets. In some instances persons were seen who were evidently suffering from pulmonary disease, and in one instance the inspector was told that the baker "raised something" and frequently spat upon the bake-room floor. Further, this man's mother, four sisters, and two brothers had all died of consumption, and the man himself works in a dark, unventilated cellar from half-past four in the morning until three or four o'clock in the afternoon.

These facts emphasize the good hygienic results which can be achieved by properly directed efforts, and the need not only of inspection but of laws which will enforce sanitary conditions in every pursuit which is connected with the comfort and feeding of the population of great cities and country towns.

The extraordinary results which have followed the campaign against tuberculosis, in the reduction of its morbidity and mortality, and which are familiar to most of our readers, is another instance of what preventive medicine can do, a result which has been fully equaled by the control of yellow fever through the investigations of surgeons in the United States army.

Finally, attention may be called to the excellent results which have followed the crusade against uncinariasis by army and public health surgeons in Porto Rico, where uncinariasis, to use the words of Ashford and King, is not only an interesting medical question, but an all-absorbing social and economic one. These surgeons state that at least "750,000 of the inhabitants of Porto Rico" are infected by this parasite, and that 70 per cent of this number are suffering in some degree from the effects of it, which in most instances is manifested by an anemia bearing from 40 to 45 per cent of hemoglobin. They also estimate that from 5000 to 7000 persons die annually in Porto Rico from this cause. It is encouraging to know that while as yet no very great diminution in the morbidity or the mortality of this infection has yet been accomplished, a thorough and complete understanding of the mode of infection has been reached, adequate methods of disinfection have been determined, and fairly adequate means of treatment after infection have also been tried and found efficacious.

A NOTE IN REGARD TO THE VALUE OF PHYSIOLOGICALLY TESTED DRUGS.

The highly commendable wave of enthusiastic effort on the part of physicians and pharmacists which is now sweeping over the country for the elimination of unethical products, while it may be in some instances excessive, is, in association with the Pure Food and Drugs Act, producing results which could not have been obtained by other means through many years of effort, and is serving to emphasize facts which have been known to cautious and up-to-date members of the medical profession for many years. One of the most important of these facts has been the recognition that many of the pharmacopœial processes, while in the aggregate correct when

employed in the preparation of crude drugs of known consistency, have been extremely faulty when used in connection with some of the most important drugs which are commonly employed by physicians. While the Pharmacopœial Committee of Revision has recognized in the last edition of the Pharmacopœia many competent tests for determining the constitution of some important remedies, such, for example, as nux vomica, it has not found it possible to discover any chemical means by which such important drugs as digitalis, ergot, veratrum viride, strophanthus, and a number of other substances can be properly tested. As it is the function of the Pharmacopœia to recognize methods which are well-established rather than to act as a pioneer in new fields, so it has been the function of several progressive manufacturers for a number of years to subject these important drugs to physiological tests made upon the lower animals, and any one who has failed to compare the variable results which he obtained from untested drugs with the accurate results which he obtained from tested samples can have no conception of the satisfaction which the use of such products brings to the anxious practitioner.

In this connection we notice with much interest a series of experiments which have been carried out by Dr. Hatcher, which he records in the *Journal of the American Medical Association* of April 6, 1907. His investigation related particularly to the question of the physiological activity of various samples of tincture of strophanthus, the tests being made upon the lower animals. It is interesting to note that these tests, while not of very great accuracy, all tended to show that most of the tincture of strophanthus which is on the market is physiologically active, and Dr. Hatcher believes that his investigations indicate to the practicing physician that as a rule he will get more constant effects when he prescribes tincture of strophanthus than when he prescribes tincture of digitalis, this conclusion being arrived at, first, because of the facts reached in his investigation, and secondly, because it is a well-known fact that digitalis leaves rapidly diminish in potency after they have been kept a number of months, even if the circumstances are favorable; whereas the same degenerative changes do not take place in the seeds of strophanthus.

We have more than once expressed our surprise that physicians who are content only to use the best of steel in surgical operations should be satisfied to employ any galenical preparation to relieve critical states which may be dispensed by any druggist, it being a well-known fact that commercial methods govern the production and sale of crude drugs quite as much as they govern the production and sale of all other articles which are to be found in the markets of the world. As most of the skill of a physician, after making a diagnosis, is exercised in determining the exact dose of a given remedy which is needed by an individual patient, it is essential that all galenical preparations like tinctures and fluid extracts should be as nearly as possible of an identical strength if his conception of quantities and doses is to be of any value to his patient.

FLIES AND DISEASE.

It has long been known by many persons, who are interested in hygiene and sanitation, that insects are far more frequently the disseminators of disease than most people think, but since the discovery that malarial fever is always transmitted by means of the mosquito and that the same methods of transmission hold in connection with yellow fever, this matter has been forced upon the minds of many who heretofore have ignored certain self-evident facts. Within the last few years a very considerable number of bacteriological and other researches have proved beyond all doubt that many articles of food are contaminated by the transmission of filthy material to food by various kinds of flies. In one particular epidemic described by Stokes, it was found that the milk was contaminated by flies that came from a neighboring privy, and several researches have shown that cockroaches aid in the spread of the bacilli of Eberth in a similar manner. Then, too, we have the interesting experi-

ments of Coplin, in which he showed that flies, after walking over typhoid excreta, laid a trail of typhoid bacilli over culture surfaces wherever they trod.

In one of the recent numbers of the *Lancet* attention is called to the fact that both in Liverpool and Glasgow a crusade is about to be introduced to diminish the number of common house-flies, and Ross and Newstead, with this end in view, have studied the life history of the common fly not only during summer months, but also during winter months as well, with the object of being able to destroy them in the egg or in the larval stage. As a matter of importance it is pointed out that the common wasp is a very active enemy of the ordinary house-fly, and therefore is an ally of man in this direction, a fact which is not generally known and which should prevent the destruction of wasps unless the place where they build their nest is distinctly one in which they may cause disaster to children. Indeed, it is stated that the wholesale destruction of wasps in some places threatens a plague of flies. Much may be done in preventing the multiplication of flies by seeing that the material upon which they feed and multiply is immediately destroyed by fire or other effective means. With an increasing appreciation on the part of the laity of the damage which these creatures can produce, it is hoped that the spread of disease through their aid will be materially diminished.

THE APPROACHING CONQUEST OF CANCER.

Under the above title there appears in the *Medical Record* of February 16, 1907, an article by Robert Bell, of London, which because of its title attracts instant attention, but which on perusal proves itself to be not merely an unprofitable discussion but one absolutely misleading in its teachings. Nor would this be worthy of comment excepting for the fact that such teachings, if accepted, are likely to result in preventable suffering and loss of human life. Thus Bell states that it must be obvious to every observer how miserably surgery has failed to give relief in cancer. This is a statement which with a germ of truth carries a huge load of misrepresentation. In advanced cases it is quite true that surgery can offer only the removal of an obstructing, disfiguring, or offensive growth, but the attainment of one or all of these ends is the means of accomplishing an enormous amount of relief. In beginning cases surgery not only relieves but absolutely cures, nor is there a single agent yet advanced, aside from operation, which for an instant can be compared in efficiency with this method of treatment. Because of the natural dread which all people have of operation of any kind, a dread happily diminishing with the advent of local anesthesia, skilful anesthetists, and a rational humane after-treatment, it is the tendency of the individual to grasp at any means of help rather than the knife. The most hopeless cases with which the surgeon has to contend are those which have wasted weeks, months, or years in futile efforts at cure by other usually far more painful and infinitely less successful means.

Bell says that two circumstances have impelled him to state his views on the approaching conquest of cancer: first, the optimistic articles appearing in the lay press, and secondly, a patient coming to him with recurrence of cancer in the right side after two extensive operations had been performed within one year, and when the condition of the parts was infinitely worse than it would have been had the breast been left alone. This patient had also been subjected to the trypsin treatment, during which the second breast had become involved. None the less, Bell states that he is convinced there is value in the trypsin treatment as an adjunct to other methods. Indeed, the central thought of his communication seems to be that the approaching conquest of cancer is based on the judicious employment of trypsin, together with measures directed toward insuring by judicious means a healthy condition of the neighboring tissue, holding that thus the colony or colonies of malignant cells are rendered innocuous and disappear by absorption, whilst the vitality of the tissues surrounding will not

be diminished as would be the case if the disease had been removed by the knife. Bell apparently believes that the most important predisposing factor in the development of cancer is autotoxemia of intestinal origin. He holds that the prevention of cancer is within the grasp of any one who will implicitly obey those laws which nature has so explicitly formulated for our guidance. Indeed, he definitely states that it is on restoration of the functional activity of the thyroid gland, together with judicious diet, abundance of fresh air, and careful attention to the hygienic condition, that we must depend for recovery and maintenance of vigorous and healthy cell life. From which the logical sequel seems to be that if these conditions be fulfilled cancer will never develop.

The article as a whole appears as an ingenious argument with a demonstration completely satisfactory to its author that cancer is due to intestinal fermentation and absorption as such. It would scarcely require comment were it not for the fact that it is likely to discourage those suffering from cancer from the only means of help and at a time when such help is likely to prove curative.

As for the conquest of cancer, the signs of its near approach are no more convincing than they were twenty years ago.

FIBROUS ENLARGEMENT OF THE PROSTATE.

By this heading, which is misleading because the prostate may be actually smaller than normal as judged by palpation, there is understood to be present a condition which interferes with micturition, not because a bulky tumor is encroaching upon the prostatic urethra, but because there is associated with this fibrous enlargement a ring-like induration due either to hypertrophy or to fibroid degeneration of the musculature occupying the position of the internal vesical sphincter. The symptoms of enlarged prostate—*i.e.*, slowness in starting micturition, absence of force to the stream, with interruptions, failure to completely empty the bladder, and ultimately constant dribbling because of the always overful bladder—are likely to be even more pronounced than when they are caused by true adenomatous enlargement of the gland, and since the indications for operation are founded on the degree and progression of obstruction, the need for surgical intervention is even more urgent than in the case of the usual prostatic overgrowth.

The complete removal of these small prostates is much more difficult than the shelling out of the adenomatous growths commonly characterized as prostatectomy. Whilst in these cases of small prostate accompanied by contracture of the internal vesical sphincter prostatectomy accomplishes a cure, it does so not because the prostate is removed but because the continuity of the ring at the neck of the bladder is destroyed. Hence it follows that under such circumstances the Bottini operation, preferably through a perineal incision, is advisable.

Pardue (*Clinical Journal*, April 17, 1907), writing on the general subject of enlarged prostate, particularly recommends in this class of cases a prostatectomy, and notes that this operation gives most excellent results. His method of procedure is as follows: The patient is placed in the lithotomy position, the grooved staff is introduced into the urethra, and a two-inch cut is made through the perineal raphe down to the staff, thus opening the urethra. The author cautions against incision of the membranous portion of this tube since this implies injury of the external vesical sphincter, an important muscle in the control of the urine after prostatectomy. A director is run along the groove in the staff into the bladder, and the staff is withdrawn. The right forefinger in then inserted into the bladder along the director, and the membranous urethra readily dilates to admit the finger, but the prostatic urethra is often contracted to such a degree that it really requires considerable force to push the finger through it. The forefinger of the left hand is now passed into the rectum, and between the two forefingers will be felt the thickness of the prostatic ring or collar. The mucous membrane of the pros-

tatic urethra is split with the right forefinger, and between the finger in the rectum and that in the urethra the prostatic collar is split toward the rectum to any degree desired. The splitting should be carried on until the entrance to the bladder is perfectly loose and free, the finger slipping in and out without the slightest resistance. The collar may be so dense as to require touching with a probe-pointed knife. Through the perineal wound there is passed into the bladder a stiff drainage-tube about the size of the thumb, this with dressings being held in place by a T-bandage. At the end of the week the stiff tube is exchanged for one of somewhat smaller caliber. The rubber tube should be worn for another week and then removed, the perineal wound being allowed to heal.

Pardue notes that a little incontinence is present after the removal of the tubes, but this soon passes off if the compressor urethræ has not been cut. The author observes that he has several cases in which the operation was performed more than five years ago in which the results are perfect.

Doubtless there is scarcely an operating surgeon who will not recall the fact that when operating upon the bladder with enlarged prostate and beginning symptoms of obstruction these symptoms have been entirely relieved after perineal section. Following this operation the surgeon practically always introduces the finger into the bladder, thus producing the degree of dilatation or even actual tearing which does away with the narrowing incident to the contraction of the internal vesical sphincter. The same end may be attained more easily and with equal safety by the introduction of a dilating instrument of sufficient power and caliber to be stretched up to 80 or 90 of the French scale, thus entirely overcoming the resistance of the internal vesical sphincter. Stretching up to 40 or 50 is practically unavailing, nor is it safe to apply even this degree of distention to the compressor urethræ muscle.

REPORTS ON THERAPEUTIC PROGRESS.

THE STEM PESSARY FOR AMENORRHEA AND DYSMENORRHEA.

CARSTENS in the *Journal of the American Medical Association* of December 29, 1906, writes as follows as to the indications for the use of the stem pessary. It probably makes no difference what kind of stem is used—rubber, glass, or metal. The author at present prefers the rubber (Chambers) pessary. It is painful to introduce. The uterus must be dilated; if there is diseased mucous membrane it needs curetting, and therefore it is necessary to give an anesthetic, as a rule. The writer keeps his patients in bed two or three days, and then they can get up and be about at their usual vocations.

If the stem is put in alone, it will often be forced out sooner or later, so a Hodge-Thomas pessary is put in to throw the uterus forward and thus prevent the stem from coming out. It is not necessary to do this in all cases, but it is best as a rule. If there is discharge, douches may be used, but ordinarily this is not needed. Never take out the stem and reintroduce it. It may be left in sometimes two or three years without trouble. The author permits his patients to travel all over the country and to Europe, and they have never had any trouble except in one case, in which pain suddenly developed, and a physician was called in to remove it. In one or two instances the patients insisted on having the instrument removed too soon, and it had to be reintroduced. This was the author's earlier experience. Now he does not take them out sooner than three or four months, and six months or a year is a great deal better. They absolutely cause no pain or distress, and women do not know they wear them unless they are told.

The greatest precautions must be taken in excluding cases of inflammation of the

tubes and ovaries and pelvic inflammations in general, because latent cases of tubal or ovarian abscesses may be lighted up by the introduction of a stem pessary and serious consequences ensue. If adhesions have taken place and the uterus is pulled down and dilated, rupture may take place of dermoid tumors, even of an intestine or of the bladder. In such cases, with amenorrhea or dysmenorrhea, an abdominal section or some other operation is probably required. The stem is not indicated there. The stem is simply for cases of slight troubles from the surgeon's standpoint, but most distressing to the patient and trying to the general practitioner.

Finally, the author sums up by saying that the stem pessary is the most useful mode of treatment, and is indicated when we have to bring on a regular menstruation in cases in which it is absent or occurs at long intervals. The same may be said of those cases in which the flow is scanty and various nervous symptoms are produced, a condition often found in fleshy women. It is also valuable in dysmenorrhea, when there are no other pathological conditions, except that state commonly called neuralgia, or when we find a small uterus, or especially a small cervix, a condition often found in middle-aged, unmarried women who have for five or ten years menstruated normally. In slight flexions or displacements with recurring stenosis producing sterility it is valuable, and will sometimes cure the last-named condition.

Contraindications are acute or latent pelvic inflammation of whatsoever kind it may be. The author especially and emphatically warns against this condition. If there has been inflammation of the tubes or ovaries, or if there are adhesions, the stem pessary should not be used. The greatest care must be exercised on this point.

Any general practitioner is able to introduce a stem pessary; no specialist is required. This article is simply written for the benefit of the general practitioner who has so much trouble with the kind of cases described.

In conclusion the writer says:

1. The stem pessary will generally cure amenorrhea after all other means have failed.

2. It will develop an infantile uterus, enlarge a prematurely atrophied one, and restore a superinvolutional womb to a normal condition.

3. It will cure most cases of intractable dysmenorrhea, when no special pathological condition can be found.

4. If worn for six months or a year it sometimes cures sterility.

5. All inflammatory conditions about the pelvic organs must be rigidly excluded before it is used. The same septic precautions should be taken during its introduction as a surgeon would take with the most complicated case of abdominal surgery.

THE TREATMENT OF PSORIASIS.

MacLeod states in the *Clinical Journal* of December 19, 1906, in speaking of the therapy of psoriasis, that of the various preparations of arsenic the liquor arsenicalis is the most generally employed, beginning with small doses of 3 minims t. i. d. and increased to 10 minims t. i. d. according to toleration. This dosage is given until the eruption disappears, unless toxic symptoms supervene, when the drug is at once stopped. The liquor arsenicalis has also been given in hypodermic injections of 3 minims in 5 minims of water daily; though it is possibly a more efficacious method of employing the drug than by giving it by the mouth, it has the great disadvantage of being painful.

In Vienna the favorite method of prescribing the drug was in the form of the "Asiatic pill," which contained 1/12 grain of arsenous acid. The late Professor Kaposi used to prescribe one to four of these, three times daily, and continue to do so till the patients had taken about six hundred of them, only intermitting them when toxic symptoms arose. Cacodylate of sodium, an organic compound of arsenic, is now extensively used in France in doses of ¼ to 3 grains of the salt by the mouth,

or by hypodermic injection. These doses are large, considering that one grain contains about as much arsenic as a drachm of liquor arsenicalis, and should be used with caution.

The author refers in his paper to the various methods of administering arsenic somewhat fully, because no description of the treatment of the disease can be said to be in any way complete without doing so, but he himself has found the drug so inconstant in its action that he has begun to lose faith in it, and to wonder whether in the cases which have seemed to do well while it was being taken the improvement did not take place in spite of the arsenic rather than as the result of any specific action on its part.

Salicin and the salicylates have been recommended as substitutes for arsenic, and especially salicin, as it is less liable to disagree than salicylate of sodium. Dr. Radcliffe-Crocker, who strongly advocates its employment, considers that it acts as a microbicide, breaking up into salicylic and carbolic acids. It is given in doses of 10 grains t. i. d. and gradually increased, and where depressing symptoms and headache are caused by the drug it is combined with small doses of tincture of nux vomica.

Various alkalies have been employed in psoriasis and in gouty and rheumatic patients with undoubted success; of these liquor potassæ 10 minims t. i. d., acetate of potash 10 to 30 grains t. i. d., and iodide of potassium in large doses have been chiefly recommended.

Thyroid extract was introduced some years ago by Dr. Byrom Bramwell for the treatment of psoriasis, and has been given an extensive trial since. Though it is believed by various observers to be occasionally efficacious, the serious symptoms which it may produce, especially in elderly people and those with weak hearts, more than counteract its doubtful utility.

In brief, it may be said that there is no such thing as a specific drug for psoriasis, and several of the so-called specifics have probably got greater credit than was their due from the fact that they were being used at a time when the disease was naturally undergoing remission. At the same time it must be conceded that salicin and arsenic may have a beneficial action, perhaps directly by acting as microbicides, or possibly indirectly through having a tonic action on the nervous system.

Local Treatment.—Although in the general treatment of psoriasis success depends much more on the judicious application of general principles than on the slavish employment of any of the vaunted specifics, with regard to the local treatment we have certain definite indications, for here we are dealing largely with effects which in the light of their histology are capable of removal by suitable remedies. Hence it is that the local treatment plays a more important part in the therapy of psoriasis than does the general treatment. The first indication in the local treatment is the removal of the scales. If the disease is at all extensive this can be done best by means of baths. A daily warm bath (95° F. to 100° F.) may be given and the individual patches scrubbed with soft soap on a piece of flannel or with soap liniment (saponis viridis two parts, spiritus vini rectificati one part), the latter being especially valuable in the removal of scales from the scalp. The bath water may be made more effective by the addition of 6 ounces of sodium bicarbonate to 30 gallons of water. The patient should remain in the bath for about half an hour, and after coming out of it and being dried each patch should be thoroughly rubbed with a two- or three-per-cent salicylic acid ointment, or if the lesions are painful, simply with vaselin or olive oil.

Where the lesions are not so numerous, and are of a chronic, resistant type, with thick, adherent scales, more powerful measures for the removal of the scales may have to be resorted to. The lesions should first be scrubbed with soft soap and hot water, next rubbed with salicylic acid, 3 per cent, in alcohol, and finally dressed with lint soaked in olive oil, applied continuously under the oiled silk.

Other methods have been suggested, such as wet packs and Turkish baths, but they

are not so effective as the warm baths and soft soap.

After the removal of the scales the next indication is the employment of one or other of the reducing agents with the object of trying to improve cornification, and so diminishing the tendency to the formation of scales. These reducing agents are said to act by subtracting oxygen from the tissues. Of these the most valuable are tar and chrysarobin, and of less importance pyrogallol, naphthol, salicylic acid, resorcin, and mercury.

In the choice of the proper remedy much care and judgment is necessary, for several of them are powerful irritants and must be used with great caution to avoid producing serious inflammation, and are only applicable to cases of a chronic type. In psoriasis also, as in almost every form of skin disease, each case must be considered and treated on its own merits, and even different patches of psoriasis in the same case may require different treatment.

Where the case is unusually irritable and the lesions much inflamed, before using any of these reducing agents it is necessary to diminish the inflammation. This may be done by dressing the affected parts continuously under waterproof with lint soaked in a solution of glycerini plumbi subacetatis (1 in 8) or applying the calamine cream (prepared calamine ℥ij, carbolic acid min. x, olive oil ℥j, lime-water f℥j). In very irritable cases bran baths are of service.

THE TREATMENT WITH ARGYROL SOLUTIONS OF THE PURULENT OPHTHALMIAS.

The *Ophthalmic Record* for December, 1906, contains an article by BRUNS in which he reaches the following conclusions:

1. The treatment of gonorrheal conjunctivitis with argyrol is efficient, provided it is instilled often enough (every 15 to 30 minutes) to keep the diseased tissues practically immersed in the solution.

2. The instillations must be continued day and night so as to render the immersion constant and afford the gonococci no chance of unchecked activity.

3. Until the formation of pus has wholly or virtually ceased the eye should not be irritated by any manipulation or the instillation of any other substance.

4. The less virulent course of the disease when so treated confirms the belief that more strenuous methods often abrade the weakened epithelium of conjunctiva and cornea and open ways of invasion to the gonococci.

5. As always, the best results are had when the remedy is thoroughly applied in the beginning of the disease. This can be done no matter how swollen or brawny the lids; a thing not possible with less diffusible liquids or with those which must be applied to the everted lids. It is excusable to repeat that eversion is dangerous in the early stage when the epithelium is softened and pus formation still profuse.

6. Under this plan corneal ulcers are uncommon, and when they do appear are held in check and do not produce wide-spread destruction. Corneal ulceration, then, far from forming a contraindication, gives an additional reason for its vigorous employment.

7. Argyrol is not a powerful astringent; therefore, as soon as pus formation has ceased and the lids have become flaccid, $AgNO_3$ solutions should be applied to the everted lids once daily to hasten the reduction of the conjunctiva.

Soaking corneal ulcers once a day in a 50-per-cent solution of enzymol seems to cleanse them, as well as the conjunctiva, and thus promote recovery. During this period the frequency of the argyrol instillations should be gradually lessened.

8. In monocular cases the safety of the unaffected eye is secured by instilling the argyrol solution but one-half as often as in the infected eye.

9. The method is far less painful, especially in the acute stage, than any other yet proposed. This is an advantage not merely of good feeling, but enables us to treat many who, even at the cost of an eye, refuse to tolerate severer methods.

10. The author has never observed argyrosis following the use of argyrol.

THE MEDICAL TREATMENT OF GRAVES'S DISEASE AND HYPERTHYROIDISM.

STENGEL in the *Pennsylvania Medical Journal* for December, 1906, writes on this topic. A few general conclusions will serve to summarize what the author details.

1. The syndrome of hyperthyroidism which is met with in its most characteristic form in typical cases of Graves's disease also attends mild and often transient enlargements or other pathological lesions of the thyroid gland. While distinguishable from ordinary Graves's disease by accurate diagnosis, and while as a rule entirely different in their clinical course and prognosis, these cases must be included with Graves's disease under the more general heading of hyperthyroidism, because in any case a gradual transition and a termination in a severe form is possible.

2. Hyperthyroidism is due to increased and perhaps perverted secretion of the gland, and is therefore prompted by increased vascularity of the gland and hypertrophy of its secretory structure. Methods of treatment designed to reduce vascularity or to limit secretion functionally or by actual destruction of glandular substance should be investigated hopefully.

3. General medical treatment, including change of scene, rest, diet, and tonics, often benefits milder cases and may mitigate symptoms even in the severe forms. Iron and arsenic; digitalis, strophanthus, and convallaria; atropine, ergot, and mild currents of faradic or galvanic electricity, are useful respectively in improving the blood, the general and the local circulation.

4. Iodine is a dangerous drug, and thyroid extract should not be employed. In some cases seemingly good results from the use of thyroid extracts have been reported. The explanation of this is difficult.

5. Three forms of specific treatment have been suggested: (*a*) By the production of antitoxic substances; (*b*) by the preparation of cytolytic substances; and (*c*) by the use of *x*-rays. The statistical evidence in favor of the antitoxic sera, such as the antithyroidin of Möbius, the milk of thyroidectomized goats, and the like, is very encouraging but cannot yet be fully accepted. The results obtained with the cytolytic serum of Rogers and Beebe are equally or even more encouraging, and the treatment seems to rest upon a scientific basis. The methods of preparing the serum, however, require refinement and elimination of certain defects. The *x*-ray treatment has not been sufficiently used to justify a final expression of opinion as to its merits.

ACIDIFIED MILK IN INFANT FEEDING.

MORSE and BOWDITCH in the *Archives of Pediatrics* for December, 1906, write on this subject, and in concluding recommend buttermilk, buttermilk mixtures, and milk mixtures acidified with lactic acid bacteria as safe foods for infants, whether well or ill. Infants can thrive and gain on them for considerable periods of time. The use of a routine buttermilk mixture, as has been the custom in the past, is not as rational as that of an acidified milk mixture modified to suit the individual case, or of buttermilk modified by the addition of cream and milk-sugar. The preparation of such acidified mixtures, while not difficult, is not very practicable for private work. These mixtures and buttermilk are almost always taken well. The results obtained from acidified milk mixtures in cases of malnutrition and chronic disorders of digestion are not materially different from those obtained from the use of other preparations of milk of the same percentages. They are, however, worthy of trial in cases of intractable disturbances of digestion, because some cases do much better on them than on other forms of modified milk.

Practically the same, and in some instances better, results are obtained in these conditions with pasteurized buttermilk as with acidified milk mixtures. This fact suggests strongly that the good results which are obtained with buttermilk mixtures are due to their low fat content in combination with a large amount of proteid in an easily digestible form, and not to the acidity or to the action of the bacteria. Pas-

teurized buttermilk gives very good results when employed as the first form of milk food after the initial periods of water and starchy diets in acute intestinal indigestion and infectious darrhea. It is possible that unpasteurized buttermilk will give even better results because of the action of the lactic acid bacteria on the intestinal flora. Fat-free milk with pure cultures of lactic acid bacteria ought, however, to be safer and more reliable than commercial buttermilk.

DIABETIC FOODS.

In the *Report of the Connecticut Agricultural Experiment Station* for 1906 we find interesting information on this subject. The necessity of excluding so far as possible from the diet of diabetic patients sugars and substances, such as starch and dextrin, yielding sugar with the digestive juices, has led to the introduction of saccharin and other coal-tar derivatives and preparations containing, or purporting to contain, no starch or starch derivatives, or else diminished amounts of these substances. The craving of the patient for sweets is sometimes satisfied, at least temporarily, by the use of saccharin, a coal-tar product several hundred times as sweet as sugar, and which is free, so far as diabetes is concerned, from the injurious properties of sugar; but the preparation of a harmless yet palatable substitute for bread requires a special flour containing a relatively small percentage of starch and special methods of bread-making.

So-called diabetic flours may be made from wheat flour by washing out a portion of the starch and drying. If the process of washing is carried far enough, crude gluten is obtained containing very small amounts of starch, and from this, after drying, may be prepared gluten flour. Crude gluten, obtained as a by-product in the manufacture of wheat starch, is said to be utilized for the preparation of gluten flour as well as a concentrated cattle food. The removal of so large a proportion of the starch materially alters the physical characters of the flour, and the bread made from it is quite different from ordinary bread. Most of the commercial diabetic flours, however, are not true gluten flours, since they still contain a considerable amount of starch—some of them so much as to render them positively dangerous for diabetic patients.

Not only all of the cereal grains but also most of the seeds of the legumes, such as field and Lima beans, peas and lentils, contain large amounts of starch and must be avoided by diabetics; the soja or soy bean, however, is a striking exception, as it contains, when ripe, no true starch, or only traces. This leguminous seed is an important food in Japan, and is being used in this country for the manufacture of meal for the use of diabetics.

The peanut, another leguminous seed, although very rich in oil, contains about 11 per cent of starch, sugar, and dextrin, of which about half is starch.

Most of the nuts, including walnuts, Brazil nuts, almonds, and filberts, since they contain no starch and only small amounts of sugar and dextrin, but are rich in protein and oil, are valuable additions to the diet of diabetics. Almond meal is used in the preparation of various biscuits and bread substitutes. The chestnut is a notable exception among nuts, in that it is rich in starch and poor in fat, the composition of the shelled nut being much the same as that of wheat flour; it is therefore entirely unsuited for the use of diabetics.

Casein prepared from skimmed milk is used for making a kind of bread entirely free from starch.

In making out dietaries for diabetic patients it should be borne in mind that starch, sugar, and dextrin are all about equally injurious, since starch and dextrin are converted by the saliva and pancreatic juice into sugar (chiefly maltose), and it is the sugar, not the starch itself, which is directly injurious. For example, changing a portion of the starch into dextrin, as is done to some extent by toasting bread, does not render it less injurious—in fact it actually hastens the formation of sugar through the action of the digestive juices, since dextrins are intermediate products in the

change. For this reason the sum of the percentages of starch, sugar, and dextrin, and not the starch alone, should be considered in valuing diabetic preparations.

SCARLET FEVER: ITS TREATMENT AT THE HOSPITAL FOR SCARLET FEVER AND DIPHTHERIA PATIENTS.

In the *New York Medical Journal* of March 9, 1907, KELLOGG tells of the therapy of scarlet fever as practiced at this hospital in New York.

General Management of the Disease.—Patients are clad in light night robes, and during cold weather wear an undervest with long sleeves. This is insisted upon, as most patients are careless about exposing their arms, neck, and chest.

They are kept in bed until the temperature has been normal for ten days, although a minimum period of three weeks is required. By following this general rule the tendency to heart and kidney complications is much diminished.

The change from the recumbent to the upright position is made gradually, allowing first one pillow, then two, three, and four, then a reclining chair, then an upright chair, after which they are allowed to stand in getting from the bed to the chair, and then to walk around the bed.

The time of discharge is determined by the completion of desquamation, which averages about six weeks. A minimum period of five weeks quarantine is required.

Diet.—During the first three weeks the diet consists of milk, after which farinaceous foods are gradually added, and later nitrogenous foods, the latter making only a small proportion of the diet until the patients are well along in the fifth week. The diet list is as follows:

Milk diet: Milk, kumiss, matzoon, junket. When specially ordered, malted milk, cream mixture (cream ℥iv, milk-sugar ℥ss, water ℥xij).

Cream soups (tomato, pea, celery).

Farinaceous diet: In addition to the milk diet and cream soups give arrowroot, corn-starch, rice gruel, rice milk, rice cream, cracker gruel, bread jelly, milk porridge, barley jelly, milk toast, other cereals.

Soft diet: In addition to the stated diet give once daily poached egg, gelatin preparations, purée of green vegetables, tea, coffee, or cocoa.

Special diet: In addition give once daily sweetbreads, calves' brains, squab, lean fresh fish.

Extra diet: In addition give once daily scraped beef, chicken, meat soups, green vegetables, and tea, coffee, or cocoa twice daily.

General diet: Give a general mixed diet, including red meats, twice daily; tea, coffee, or cocoa three times daily.

A great effort is made to give the patients as much variety as possible and at the same time make the changes and additions gradually.

Beginning as soon as possible after admission to the hospital all adults are given eight ounces of milk every two hours from 6 A.M. to midnight. To children a proportionately smaller amount is given. In a few cases the difficulty of feeding children is overcome by gavage.

Water.—The importance of giving water freely cannot be overestimated. The surprisingly low percentage of kidney complications in this hospital, which so far as the author has been able to ascertain has not been equaled by any other institution in the world, is attributed justly to the large quantities of water the patients drink. Care should be taken, however, not to overdistend the stomach by giving too much at any one time.

It is his custom to give all adult patients 8 ounces of water every two hours, beginning at 7 A.M. and ending at 11 P.M., thus allowing one-hour intervals between the administration of milk and water. To children a proportionately smaller amount is given.

Urine.—Daily examinations of the urine are made, and it is not unusual to find the specific gravity standing at 1.004 or 1.006, while 1.010 or 1.012 is considered an indication for increasing the quantity of water.

Under this treatment the transient albuminuria which we are taught to expect in the early stages of the disease is an exception rather than the rule, and acute nephritis is very rare.

The Care of the Skin.—The popular method of oiling the surface of the body, while it tends to prevent desquamated epithelium from flying about and by its softening effect will help to loosen the dead skin, is often used over too long a period. It is important that the excretory function of the skin shall reassert itself as early as possible so as to relieve the extra strain thrown upon the kidneys, and the long-continued use of emollients after desquamation is well advanced is a mistake. It is the custom of the author to limit the oiling of the body to the early days of the disease, and then to use it only in those cases in which the skin is much irritated or pruritus is a prominent symptom. For this purpose cacao butter is excellent.

If the skin is so irritated as to cause considerable pruritus, a most soothing effect can be obtained by sponging with the French bran bags. The calamine lotion used by the dermatologists is also helpful in cases of marked irritation.

℞ Pulv. calaminæ, ℥j;
Zinci oxidi, ℥ss;
Glycerini, mins. xv;
Aquæ rosæ, f ℥j.
M.

The daily warm bath may be permitted from the onset of the disease, although little friction should be used in drying the body. The bath often has a most soothing effect on the restlessness and delirium in the early days of the disease. Special efforts directed to detaching the skin from the general body surface do not shorten the period of quarantine, since the soles of the feet are far behind the general body surface in desquamating.

With adults the question of how to hasten the desquamation of this thick, callous skin must always be considered, for if no attention is paid to it the feet will often take eight or ten weeks to desquamate, while it can usually be brought to a termination in six weeks and sometimes in five by beginning treatment early. The method which the author has found most successful is to soak the soles of the feet once or twice daily in a strong solution of washing soda for ten minutes, and then in hot soap-suds for the same length of time, after which they are rubbed vigorously with a rough towel. This is continued until the skin shows signs of loosening, after which soap and water only are used.

The Care of Nose, Throat, and Nasopharynx.—Serious involvement of these cavities, and continuous absorption, is often met with, a condition which keeps up the temperature and conduces to kidney congestion as well predisposing to otitis media and its sequelæ. Here cleanliness is of extreme importance and must be insisted upon, even at decided discomfort to the patient.

The treatment of the throat by means of gargles and sprays is inadequate if the involvement is at all extensive, although a certain amount of relief will be obtained from the local application of hydrogen dioxide, solutions of potassium chlorate, or of tincture of ferric chloride. In nearly all cases the author makes use of a douche or irrigation.

Normal saline is the solution ordinarily used. Occasionally when the throat is dry and glazed, a solution of sodium bicarbonate (one tablespoonful to a pint of water) is preferred to soften tenacious mucus or start secretion.

Boric acid, potassium permanganate, and other antiseptic solutions possess no apparent advantage over the salt water, which not only has a soothing and cleansing effect, but will do no harm even if a considerable quantity is swallowed while the patient is being "broken in" to the treatment.

The solution is made as hot as it can be borne without discomfort, usually 110° F. at the start, with a gradual increase to 125°.

The quantity used is about two quarts; sometimes, however, it is necessary to diminish the amount, until the patients learn

to let the water flow out of the mouth without exhausing themselves by gagging and straining.

The severity of the infection plus the ability of the patient to stand the irrigation determine the frequency of the treatment. Severe cases as a rule are irrigated every two hours from 6 A.M. to midnight.

The patient, protected by a rubber sheet, is turned on one side with the cheek resting on the edge of a pus basin, and the head is lowered slightly by removing the pillow. (Infants are prepared as for intubation, by wrapping them from the shoulders to the feet in a strong sheet fastened firmly at the shoulders, elbows, wrists, knees, and ankles.) A fountain or Davidson soft-rubber bulb syringe is used. The straight tip of the syringe is introduced into the mouth in the median line and carried back to the base of the tongue, which is held down so as to expose the back of the throat. The solution is then directed with considerable force against the pharynx, or the part of the throat from which we wish to dislodge the membrane. When the mouth is filled the tube is compressed with the finger, and the patient is allowed to expel the solution into the basin. This process is repeated until the treatment is finished.

The effect of the treatment described is to relieve pain, dislodge membrane, and wash away thickened mucus more thoroughly than by any other means with which the author is familiar.

The possibility of carrying infection from the throat to the ears has been urged as an objection to this method. In the author's experience this complication has not been observed. Most cases require no other local treatment.

When an organized membrane covers the pharynx resembling diphtheric membrane, the author has found it helpful to use the following solution suggested by Dr. Odendorfer:

℞ Chloral hydrate, gr. x to xx;
Glycerin, ℥j.
M.

This can be advantageously applied to the edge of the membrane with a long glass pipette. Fifteen to twenty drops is sufficient for a treatment. It produces slight local anesthesia, thereby diminishing pain, is antiseptic, and has a decided softening effect on the membrane. Apply about twenty minutes before the irrigation and repeat as often as necessary.

Frequently it is difficult for patients to take the amount of milk and water prescribed because of the difficulty in swallowing. This is gradually overcome by the irrigations, but much temporary relief may be obtained if the patient is allowed to hold in the mouth and slowly dissolve an orthoform lozenge (¼ grain). Some complain of dryness of the throat and slight nausea after the frequent use of this drug, but the majority are much benefited.

ASTHMA IN INFANTS AND CHILDREN.

In the *Clinical Journal* of February 27, 1907, CAUTLEY tells us that the prophylactic treatment consists in bringing up the predisposed in the most suitable manner as regards hygiene and diet, and prevention of catarrhal conditions. The body should be kept warm and the apartments cool. A high, dry air, such as Mont-Dore-les-Bains in France, the Engadine, or Colorado, is more suitable than the seaside for the spasmodic condition, but where there is much catarrh it is important to choose a warm, dry climate, or seaside air and sandy soil, with the object of curing the catarrh. Places such as Bournemouth, Hastings, and the Ascot district in England are suitable. High altitudes are also unsuitable for emphysema.

The diet should be simple, nutritious, and consist of small, regular meals, avoiding all meat extracts and excess of carbohydrates, and not allowing much meat. Fruit may be given liberally. An antidiabetic diet has, in the experience of the author, proved absolutely useless. The bowels should be kept open. Attend to all local sources of irritation, and remove adenoids or enlarged tonsils if present. Keep the child in as good health as possible, devoting attention to rendering it insusceptible to dyspepsia and catarrhal conditions, and to increasing the stability of the respiratory center.

During a paroxysm of spasmodic asthma a warm bed in a room with open windows may be all that is necessary in mild cases. In more severe cases some of the following methods may be adopted: In order to induce general vasodilatation give a hot-water or vapor bath; hot fomentations or turpentine stupes to the chest; nitroglycerin, nitrites, or inhalations of amyl nitrite; chloral by mouth or rectum; or alcohol. Constriction of the respiratory mucosa can be induced by inhalation of cold air from ice in a jug or inhaler; adrenalin, 1 in 1000; the fumes of brown paper, nitre paper, the leaves of stramonium, belladonna, or hyoscyamus, or Himrod's powder. Most of these remedies are irritating, unsuitable, and injurious in the catarrhal asthma of infants, in which more benefit is derived from the inhalation of terebene, creosote, or vapor pini sylvestris. An emetic is often useful at the onset of an attack, and for this purpose the syrup or the wine or powder of ipecacuanha can be given. In older children, unable to swallow, one-tenth of a grain of apomorphine may be given subcutaneously. Emetics help the child to get rid of mucus and also act as cardiac depressants. Many cardiac depressants, such as tartar emetic and lobelia, rarely do good until they produce a feeling of nausea and faintness or collapse. Then the dyspnea at once ceases, either because of the relaxation of the spasm or the subsidence of the congestion, due to cardiac depression. Of other remedies may be mentioned belladonna by the mouth and atropine or pilocarpine subcutaneously, cocaine sprays (2 to 5 per cent) to the nose, counter-irritants to the chest, dry cupping, and occasionally bleeding. Morphine subcutaneously is very useful in bad attacks, but should rarely be employed for children.

For prevention of the nocturnal paroxysms give antipyrin, phenacetine, or bromides at bedtime, with small doses of heroin during the day.

Between the attacks treatment must be directed to the general health. A course of potassium iodide, or syrup of the iodide of iron and cod-liver oil, is advisable. Arsenic is very beneficial in cases in which there is a tendency to glandular enlargement, while strychnine and cinchona form useful tonics. Cauterization of the nose may be tried. As a general principle it is infinitely more important to attend to the general health of the child, to prevent erroneous methods of feeding, to remove local sources of irritation, and to cure the catarrhal tendency, than it is to rely upon measures for relieving or cutting short the paroxysms.

THE GREAT VALUE OF INOCULATION AGAINST PLAGUE.

The annual report for the year ending March 31, 1906, of Lieut.-Colonel Bannerman, the Director of the Plague Research Laboratory at Parel, Bombay, is one of very great value and interest. We direct special attention to the section dealing with the results of inoculation against plague.

The result of recent research into the etiology of plague, far from lessening the value of prophylactic inoculation, has rather tended to emphasize its value as one great practical means of protecting communities against the dread disease.

It is admitted that plague spreads among rats and from rats to man by means of the rat-flea (*Pulex cheopis*), and this is the sole proved means. Moreover, it has been shown in the report under reference that the plague germ is not to be found outside the bodies of living creatures, and that it is therefore useless during plague epidemics to disinfect floors and walls in which no living plague germs exist. Endeavor must therefore be directed on the lines of Dr. Hossack's recent paper (*Indian Medical Gazette*, January, 1907, p. 8) to find an efficient destroyer of fleas. Until a satisfactory method of destroying rats and fleas is discovered the sanitarian must trust to one or other of the two remaining methods of dealing with an epidemic, viz., he must either persuade the people of the afflicted place to leave both rats and fleas behind by evacuating the infected houses, or he must persuade the people to be inoculated and so

immunize themselves to a disease which is present around them in epizoötic form.

Two excellent papers are published as appendices to this report, one by Capt. Percival Mackie, I. M. S., and another by Dr. Winter, which show how quickly the microbes of plague disappear when brought into contact with ordinary saprophytic earth germs, and these results have been confirmed by the experiments of the Plague Commission (see *Journal of Hygiene*, Special Plague Number, Sept., p. 518).

The importance of the results of these experiments has not been fully realized; they dispose of the older theories of a "soil poison," and of the older methods of disinfection. Attention must therefore be directed to the temporary evacuation of infected houses and to methods of disinfection which will kill the danger-bearing flea and the infected rat. There also remains inoculation.

There is a very general unanimity among medical men as to the very great value of inoculation. Its value has been seen from the first, and was long ago demonstrated with a wealth of statistics in the report of the Indian Plague Commission, of which Sir T. Fraser and Sir A. E. Wright were prominent members. Of recent years this has been so well recognized that the same care has not been taken to collect, or, if collected, to publish, the results of prophylactic inoculations. Lieut.-Colonel Bannerman, however, recognizes the great educative value of repeatedly published statistics, and in the present report has brought together a remarkable mass of evidence, unanimous as to the much lesser case-incidence and lesser case-mortality in inoculated communities, and unanimous as to the absence of any ill after-effects of inoculation. It also appears that there is a very general opinion among those who have largely used the prophylactic that the protective effect lasts from six to twelve months—that is, over at least one whole plague season.

It is impossible to summarize the reports here collected in favor of inoculation. They run to some eight pages of Colonel Bannerman's report and have been sent in by civil surgeons, medical officers of regiments, superintendents of jails, medical missionaries, and assistant surgeons from all parts of India and Burma.

The saving of life by means of inoculation is strikingly shown by the following figures reported by the Executive Health Officer of Bombay. Of the Health Department Labor Staff 7182 were inoculated; there were only 13 deaths from plague, a percentage of 0.18, whereas in the 418 non-inoculated members of the staff there were no less than 26 deaths from plague, or a percentage of 6.02 (as contrasted with 0.1), or a difference of 97 per cent in favor of the inoculated.

Lieut.-Colonel Bannerman also quotes the very striking results of the protection afforded by inoculation to the prisoners in the jails of the Bombay Presidency. Major J. Jackson, I. M. S., the then officiating inspector-general of prisons, published a notable contribution to the literature of antiplague inoculation. From this contribution it is noted that in 1897, with a daily average population in jail of 8392 prisoners, there were 43 cases (and 27 deaths) from plague, while in 1904 there were only 8 cases and 5 deaths. "As inoculation," writes Major Jackson, "has been more and more resorted to in the prisons, so the incidence of plague and death-rate has diminished. Plague in fact has been banished from Bombay prisons, and as a factor in mortality it has sunk to the level of measles. Even the people in Dharwar are saying: 'The prison is the only place plague does not go to.'"

The authors are not disposed to attribute this wholly to the good effects of inoculation. Plague must needs be constantly introduced into jail segregation wards by new arrivals; that it does not spread or remain is due to the high sanitary condition of the jails.

Major Jackson also shows that no ill effects follow inoculation; in fact in one group of 236 inoculated prisoners and 236 non-inoculated prisoners it was found that the inoculated prisoners so far from being the worse for the inoculations actually put on more weight than the non-protected!

The authors commend this report to the attention of all medical officers and earnestly invite them to do all they can to encourage antiplague inoculation in the communities among which they work. The striking life-saving value of inoculation is known and admitted by all who have studied the question. It is the only ready, tried, and prepared method they have for fighting plague. Let it be used now, and not wait to get rid of plague when the sanitary condition of Indian towns and villages has reached a European level. This they hope may come in time; meantime lives can be saved by antiplague inoculation.

For facts and figures to convince the few remaining skeptics the authors recommend a perusal of Lieut.-Colonel Bannerman's report.—*Indian Medical Gazette*, February, 1907.

WHOOPING-COUGH: ITS TREATMENT BY AN IMPROVED ABDOMINAL BELT.

In the *Archives of Pediatrics* for February, 1907, KILMER says that since writing his first paper some three years ago upon the treatment of pertussis by means of a slightly constricting elastic abdominal belt, there has been ample proof by the many cases recorded to date that by this method about 95 per cent of cases are positively benefited. This is especially true with regard to the cessation of vomiting.

The first belt was composed of a long strip of silk elastic webbing placed over a stockinet band; this, while efficacious, was nevertheless warm to the child and expensive to the parents. The new belt to which the author calls our attention is made of linen, with a strip of silk elastic webbing two inches wide inserted on either side. This is sufficient to give the belt elasticity, yet does not add materially to its weight. The belt laces in the back, and by means of the lacings any degree of constriction may be maintained; it is worn over the undershirt or band. The width should approximately be as follows: For infants, 4 to 5 inches wide; for children, 5 to 8 inches wide.

The length of the belt should be such that when complete it should measure three inches less than the circumference of the abdomen at the navel. The degree of constriction should be determined in each individual case; usually a slight degree of constriction is sufficient to produce a moderation of the cough and a complete cessation of vomiting. If, after having applied the belt, the symptoms do not abate, tighten it slightly.

A sense of comfort is generally expressed by children who are old enough to make themselves understood. These belts can be made by any instrument-maker at a few hours' notice; the usual mode of procuring them in any individual case is to send the measure of the circumference of the child's abdomen (at the navel) to the instrument-maker, also stating the age of the child, and in twenty-four hours' time a belt is ready for application. The belt is best applied by the attending physician, and the parents and nurse should be instructed in its use.

The cost of these belts is nominal, from $1.50 to $3 being charged for their making. In dispensary cases and where the parents cannot afford the belt, the author has used an ordinary muslin binder, and although this is not as elegant as the belt, the results are very satisfactory.

THE PRACTICAL APPLICATION OF THE NEWER KNOWLEDGE OF THE CHEMISTRY OF MILK.

Certain recent work upon the chemistry of milk bids fair to revolutionize to a marked degree our conception of the problem of artificial feeding. Many of the valuable rules and principles which now guide us have been developed through clinical observation and experimentation without any very systematic effort to find reasons for their successful employment. Little assistance in the solution of these problems could be derived from the older treatises upon the chemistry of cow's milk. With the publication, however, by an American investigator, Van Slyke, of his researches into the commercial processes of cheese-making, certain

data became available which were capable of furnishing important deductions applicable to infant feeding and infant digestion.

These data may for present purposes be summed up by saying that the casein in suspension in cow's milk, which, as calcium casein, normally holds in combination a definite amount of calcium, is readily transformed by the rennet ferment in a weakly acid medium into the calcium paracasein or junket clot. By the further addition of acid the clot is changed into acid paracasein curd. No such clotting or curdling by rennet will take place if the milk is made alkaline, but subsequent neutralization of an alkalinized milk by a slight excess of acid will restore its susceptibility to rennet action. A moderate acidity enhances the activity of rennet, but with the absence of rennet sufficient acid to fully satisfy the casein's affinity for acid so changes the casein into acid casein curd that the subsequent addition of rennet produces no alteration in the type of curd.

In short, the power of casein to combine either with alkalies or acids is so definite that it can be utilized to modify or prevent the formation of the large, tough, contractile curds which result to a greater or less degree from the combined action of rennet and acid upon cow's milk when introduced into the human stomach.

We have thus discovered that the addition of alkalies to milk not only forms new chemical compounds with casein, but produces distinct effects upon the processes of digestion. A small amount of the alkali simply delays curdling pending the neutralization of the alkali by the acids present in or secreted by the stomach. This delay alone tends to prevent the curdling of the milk in large, solid masses, and favors the formation of smaller and more flocculent curds. On the other hand, if the alkalinization is sufficient not to be overcome readily, part of the still uncurdled milk will probably escape through the pylorus to be digested in the intestine, and so relieve the stomach of part of its work. If the gastric digestion is weak and faulty, this is often an advantage, and it may even be possible to shift the entire burden of digestion to the intestine.

It is evident that agents capable of such radical influence upon the processes of digestion should not be used without careful discrimination. They may be of extreme value in the feeding of infants unaccustomed to the digestion of cow's milk or for infants with weakened gastric digestion. We may employ them to change the character of the curds or to divide the labor between the stomach and intestine, so as to avoid overtaxing the former organ; but we must keep in mind that the infant's stomach must be developed during infancy, and that it gains strength only when a carefully graded increase of work is demanded of it. Grading the increase of work is indeed the true explanation of the results obtained by the time-honored use of lime-water as a routine measure in modifying milk. By the addition of one ounce of lime-water to every 20 ounces of milk mixture irrespective of the quantity of milk entering into its composition, the casein in the earlier and weaker mixtures is more profoundly affected by the lime-water than in the later ones in which the milk is progressively increased while the quantity of lime-water does not vary. The inhibiting action of the alkali upon coagulation is thus gradually withdrawn as the normal stomach in its development becomes equal to greater tasks.

The various alkalies in common use do not necessarily act in precisely the same way. Lime-water is distinctly alkaline and but weakly antacid. The calcium of lime-water enters up to a certain limit into further direct combination with the casein, and this is probably true of the sodium, magnesium, and potassium of the other alkaline antacids. It is extremely probable that these new combinations vary in their digestibility, and more especially in their solubility. In disturbed conditions of the stomach, accompanied by the formation of abnormal acids, alkaline additions to the milk neutralize these and prevent sudden and disastrous curdling of the milk in large masses, such as may be formed in the presence of rennet by abundant acid. One

of the sources of an undue amount of acid may be the lactic acid salts present in milk which has just begun to sour. In this stage it is more dangerous for infants than a fully soured or clabbered milk, for in the latter stage the lactic acid has removed the calcium from its union with the casein and made lactate of casein, and in this form rennet cannot change the soft acid curds into those which are tough and leathery. Decalcified casein will then not only not form tough curds, which may be difficult or even impossible of digestion, but a further combination of the acid with this decalcified casein makes a soft, friable, and easily digested lactate of casein curd. This is the principle which underlies the use of buttermilk and acidified milk in infant feeding.

A similar decalcification of the casein by the citric acid radical of citrate of soda, the consequent prevention of tough rennet curds, and the easier digestibility of the subsequent combination of the casein with the hydrochloric acid of the gastric secretion explain the present popularity of citrate of soda, which it is claimed enables larger proportions of milk to be given without digestive disturbance. Thus, with some definite understanding of the action of both alkalies and acids upon milk and their effects upon the digestive processes, the way is cleared for their more intelligent use both as routine measures and in the treatment of infants with enfeebled or disturbed digestions.—*Archives of Pediatrics,* February, 1907.

THE TREATMENT OF NEPHRITIS.

WEBSTER in the *American Journal of the Medical Sciences* for February, 1907, reminds us that it is a matter of common knowledge that in acute nephritis water is the substance most difficult to get rid of through the kidneys. How irrational then is the idea of ordering a rigid milk diet and forcing water. The main effect of such treatment will be the overloading of the blood with material that cannot be excreted, thus increasing an already existing edema, and at the same time causing the heart to work harder to force the increased volume of blood, thus increasing the danger of hypertrophy and later dilatation of this organ.

In cases which are less severe, and not accompanied by a high degree of oliguria and edema, milk to which has been added a little calcium carbonate to form the insoluble calcium phosphate may be given in quantities not to exceed, on the average, three pints, and the remaining caloric value necessary to maintain the standards of the system may be made up of fat in the form of cream and cereals. It must be remembered that, in our efforts to protect the kidney from overwork, we must not go so far as to injure other organs, and at the same time the whole organism. Our idea must be to preserve the general nutrition at as high a standard as is compatible with the best working powers of the kidney. We therefore gauge our diet largely by the degree of oliguria and edema, decreasing the former as the latter increases, and *vice versa.* Meat broths should be interdicted to the last inasmuch as these contain practically nothing but uric acid, purin bases, and creatinin, and in consequence can have very little nutritive value and may irritate the kidney attempting to excrete them.

In the later stages of acute nephritis the food may be gradually increased as desired, care being taken to avoid a large excess of proteid. As is often the case, three or four quarts of milk are given daily in the convalescent stage. Such treatment is bad because the fluid, finding its way into the circulation, may overburden a weakened heart; furthermore, the amount of proteid thus introduced is unnecessarily high. It may be said that it is unnecessary to limit the patient to white meats by depriving him of the red meats. No difference is found between them as to their influence on the general metabolism and on the regenerative processes in the kidney.

Exactly the same procedure as outlined above should be followed in cases showing acute exacerbations of the chronic form.

When we consider the chronic types of nephritis we have a different view-point to study. These types are essentially chronic

—that is, they continue for long periods of time. As curing such a case is, at present, out of the question, we should direct our efforts to maintaining the general body activity at as high a plane as is consistent with the condition of the kidney. Sooner or later the chronic forms, particularly the interstitial type, become practically heart cases and should be treated as such. We are therefore justified in allowing the patient more or less latitude in the choice of his diet, remembering certain precautions. The intake of fluid should be limited to some extent. The idea of forcing a milk diet with plenty of water is harmful not only to the kidney, but, what is more important, to the heart. A liberal proteid diet is permissible, and no difference need be made as to white or red meats. Condiments are to be avoided as far as possible. Fresh fruits and vegetables may be ordered as desired, recalling the fact that von Noorden advises against the use of radishes and celery, but permits asparagus. Coffee, tea, alcohol, and tobacco should be used with great moderation.

In regard to dechloruration, it is to be said that the limitation of salt in the diet is unnecessary, since it seems that the theory upon which its deprivation is based is not tenable. Experiments are still necessary to prove that the edema is dependent on the retention of salt, and also to prove that the salt is actually instead of apparently retained. It is true, however, that some cases are benefited by dechloruration, but it seems doubtful that such results are due entirely to the withdrawal of salt.

It must be recalled that each person needs a certain definite amount of energy to maintain himself in healthy equilibrium. With a nephritic the same thing is true within certain limits. As the energy comes from the food it is rational to construct the diet with definite caloric values in view, remembering that it is advisable to restrict the fluids to some extent and to confine the proteid intake within 100 grammes (on a basis of 70 kilogrammes of body weight). If the reasoning of Chittenden and Folin is correct we must reconstruct our ideas of the proteid need of the system to a basis far below that of the old-established formula of Voit (118 grammes of proteid on a basis of 70 kilogrammes of weight). An excess of proteid is the dangerous thing in the dietary of a chronic nephritic.

We must not forget in our dietetic treatment of nephritis that the digestive powers of the patient should be carefully watched. The digestive tract is a prolific source of toxemia, and should, therefore, be carefully regulated. Likewise, the functional power of the liver should be maintained at a high standard to protect the system against accumulation of abnormal products of a deranged hepatic metabolism.

A BRIEF STUDY OF A DIPHTHERIA EPIDEMIC AT THE ADIRONDACK COTTAGE SANITARIUM (FOR INCIPIENT PULMONARY TUBERCULOSIS).

This report is published in the *American Journal of the Medical Sciences* for February, 1907. The authors conclude that:

1. In institutions immunizing doses of antitoxin of 500 units should be given every two weeks for two or three times.

2. Diphtheria may occur in patients two weeks after an immunizing dose of 500 units.

3. It is unnecessary to endeavor to separate individuals with positive cultures from the nose or throat without clinical symptoms from those with negative cultures when immunization is carried out.

4. One negative culture from the throat is sufficient neither for diagnosis nor for raising quarantine.

5. The advisability of taking cultures from the nose except in nasal diphtheria may be questioned.

6. Careful isolation for three or four weeks under a trustworthy nurse should be practiced. After that time the patient with a positive culture should be kept out of the general dining-room or buildings and at a distance of four feet from all non-diphtheric patients.

7. Some untoward symptoms, usually slight, appear in most patients. A rash,

arthralgia, swelling, and general malaise occur most frequently. A slight transitory rise of temperature occurs frequently.

8. In institutions where the outdoor treatment is rigidly enforced the epidemic will probably be cut short.

9. In the presence of a diphtheria epidemic, patients with pulmonary tuberculosis should be treated as regards the diphtheria as otherwise healthy individuals.

10. When the tuberculous contract diphtheria they should be moved out-of-doors as soon as possible.

11. Mild diphtheria seems to exert little or no harmful influence upon the pulmonary lesion in the tuberculous.

12. The antitoxin in small or large doses seems to have little or no effect upon the pulmonary tuberculosis.

13. Immunizing doses may be given to patients with fever.

14. Complications seem to occur after diphtheria no more often, possibly less, in the tuberculous than in the non-tuberculous.

THE USE OF POTASSIUM PERMANGANATE AND FORMALDEHYDE FOR DISINFECTION.

In the course of an excellent article upon the prevention of disease FIELD advises in the *Medical Record* of March 9, 1907, that the following method be employed in the use of formaldehyde for disinfection. This method is very simple, requiring no apparatus except a tin pail of sufficient capacity, best made with flaring top. It is made with a double bottom, with one-quarter inch air space between the layers of tin, and is entirely covered on the outside with asbestos paper. Instead of this apparatus an ordinary milk pail set into a pulp or wooden bucket will answer every purpose.

The room is sealed, and fine needle-shaped crystals of potassium permanganate (3½ ounces to each 1000 cubic feet of air space) are placed in the container. Over this salt is poured 40-per-cent solution of formaldehyde (1 pint for every 1000 cubic feet of air space). The operator should leave the room quickly, as large quantities of gas are at once evolved. The results of laboratory experiments have shown that the gas thus evolved acts more thoroughly on account of its great concentration, and kills very resistant microörganisms, even when concealed under several thicknesses of cloth. The Marine Board of Health recommends 6½ ounces of permanganate and 2 pints of formaldehyde solution for every 1000 cubic feet. Presence of moisture in the air is essential. The disinfection of the room, the woodwork, furniture, and floors with liquid disinfectants (mercury bichloride 1 to 1000) is as important in this mode of disinfection as in any other. The method requires the use of common and relatively cheap chemicals, so that it is estimated that the disinfection of 1000 cubic feet costs about 75 cents. Based on this method, proprietary preparations are on the market under fanciful names, and for which extravagant claims are made, but they are in no way superior to the simple methods, and their use should be avoided because of the uncertainty as to the amount of gas they will evolve.

THE TREATMENT OF INFECTIVE THROAT CONDITIONS.

YOUNG in the London *Practitioner* for March, 1907, says that there are three useful combinations prepared in the form of compressed tablets which the writer occasionally uses, as follows:

1. Sodii bicarb., grs. xij; ac. carbol. pur., grs. ijss; sod. chlorid., grs. ij. Dissolve in a tumblerful of tepid water.

2. Zinci sulph., alum. sulph., ää 3 grs.; pot. permang., grs. ij. Dissolve in one pint of tepid water. (This has the disadvantage of staining linen, etc.)

3. Another useful combination is the following: Sod. bicarb., sod. borate, and sod. chloride, ää 5 grs.; sod. benzoate and sod. salicylate, ää 7.24 grs.; ol. eucalypt., 7.48 mins.; thymol, 7.48 grs.; menthol, 7.96 grs.; ol. gaultheriæ, 7.6 mins. One tablet dissolved in 8 ounces of water.

These preparations may be used in various ways.

Throat Douching or Spraying.—This perhaps gives greater relief than any other method, and spraying is, as a rule, more grateful than douching. Preliminary cleansing is essential to success. For scarlatinal throat, simple tonsillitis, and syphilitic erythema, it will be sufficient to use either of the solutions made from the above-named compressed tablets, perchloride of mercury 1 in 2000, or boracic acid 5 to 10 per cent. Acetozone, about 10 grains per pint, is useful; it is powerfully germicidal and non-irritating.

For septic or follicular tonsillitis, and for diphtheria, the solutions mentioned should be used in fully twice the strength, but care must be taken, in the case of the mercury perchloride solution, that it is only administered by a careful and trained nurse. Ichthyol (from 1 to 2 drachms in 4 ounces of water) is occasionally useful in irrigation; or the following: Ichthyol, grs. 50; sod. chlorid., grs. 25; aq. dest., 6 ounces.

In cases in which rhinorrhea persists in the shape of a thin serous discharge, the author has often found that the addition of a little methylated spirit (about half an ounce per pint) to the lotion used for douching has had a most beneficial effect. Failing this, weak solutions of adrenalin chloride (m. x to xx, per pint of saline solution) may be tried.

THYROID AND SALICIN IN PSORIASIS.

In the course of an article by CROCKER in the *Clinical Journal* of March 6, 1907, he tells us, when speaking of the use of thyroid gland in the cure of this disease, that when it was brought before the profession by Dr. Byrom Bramwell, who was the first to draw attention to it, it was lauded to the skies, and everybody thought a remedy for psoriasis had been found which was going to cure all the cases. But this was found to be wrong. And just as there are contraindications for arsenic and indications for it, so there are indications and contraindications for thyroid extract. It has been thrown aside altogether by a large number of dermatologists and medical men generally, some of whom said it ought never to have been given, and that it must not be given for psoriasis. But, as a matter of fact, its action is sometimes most striking. In the case of one patient thyroid extract acted like a charm, and in three months he was cured of an extensive attack. But the disappointing feature is that in the next attack, which he had in the following year, it failed completely, and that has been one of the reasons why it has fallen into disuse, and almost into disrepute, for the disease.

One can never be quite sure of the cases which will benefit. But if we do get the right case the effect is sometimes more rapid than from any other internal medication. The difficulty is to know which is the right case. We should not give it when the eruption is developing. In the author's experience in trying it on some cases when the eruption was developing, the eruption then came out in a most profuse way. Again, it should not be given in the case of persons who are elderly or who have any weakness of the heart. The author never gives thyroid extract in people over fifty years of age. He has observed most depressing effects produced by it, and the thyroidism can develop to a dangerous extent. Another point is that thyroid extract should be given gradually—that is to say, begin with a single 5-grain dose, and not increase it for a week or ten days; then make it a 10-grain dose; and ultimately, in the course of a month, get up to 15 grains. The author has seldom found it necessary to go beyond that, and it would not be wise unless we had the patient in bed and under observation constantly. But if given to a young and sound person no such harm is likely to accrue. If we have a case which has been uninfluenced by other things there is no harm in trying thyroid; it is more likely to succeed in wide-spread and active cases than where there are only a few chronic patches—in fact, for the very chronic patches internal medication is not worth trying.

The last drug which the author mentions in treatment is what he refers to as his "own little ewe lamb"—salicin. That is

the drug he uses most largely in the treatment of psoriasis, because it is applicable to a wider range of cases, and because it is successful in a large number of the cases of this disease. He does not claim that it cures all cases. He does not claim that it cures all attacks in any one patient, though it does in the majority; neither does he claim that it has any preventive action any more than arsenic has. But he claims that in a large proportion of cases it is useful, and that in a very fair proportion it is extremely successful. In a few it is rapidly successful. The more acute and widespread the case, the more likely salicin and its congeners are likely to be successful. In one case the treatment has been successful in each attack. But where there are chronic, hard patches, salicin seems to have only a moderate effect. The indurated, thickened patches must have local treatment to remove the crusts. Without anticipating any striking improvement in them, there is a certain amount of benefit observable. In order to get good results from salicin it is necessary to give it in fairly full doses. Begin with 15 grains three times a day directly after meals, and increase it up to 20 grains, and even up to a higher dosage. Salicin is soluble up to 19 grains to the ounce; therefore, if it is given in greater strength than that it must be suspended in tragacanth or some similar mucilaginous mixture.

The author gives salicin instead of salicylate of soda because salicin seldom upsets the patient; salicylate of soda very often does. Salicin also can produce a rash of its own—an erythematous eruption of a transitory character; but since the writer has given it so largely—in hundreds of cases—he finds the salicin eruption extremely rare, say not in more than one per cent of the cases. If there is such a rash, it is generally morbilliform, without itching, which disappears within a short period of the cessation of the drug. Salicylate of soda produces a good deal of depression in full doses, and he chiefly gives it when he has reason to believe there is hepatic indolence and stomach troubles, for which salicylate of soda is often useful; and he gives it more for its effect on the gastrointestinal canal and liver than for its effect in psoriasis, although as a by-product it is often beneficial in both. With regard to intramuscular injections of mercury, these are very rarely resorted to and very rarely required. In a few cases which have resisted other treatment altogether the author has used those injections with success, just in the same way as it is used for syphilitic eruptions, although it has nothing to do with syphilis. The preparation he used was the sozoiodolate of mercury, ¼ grain injected into the buttock deeply once a week, exactly as for syphilis.

The local treatment of psoriasis is very important. Here, again, there are certain drugs which have a special vogue—namely, tar and chrysarobin—but they require great care in use. With regard to chrysarobin, it is one of the most efficacious of the local remedies in certain cases, but in irritable cases it often spreads the disease instead of curing it. In one instance in which a very strong preparation of chrysarobin was used on a patch on the back, before the patient was seen by the writer, while it had only little effect on that patch there was a copious crop of small spots developing in the neighborhood for several inches beyond the original patch. Judgment, therefore, is required in adapting the strength of the drug to the condition of the skin. If there were great inflammation the author would treat it, as if it were eczema, with calamine liniment, or glycerin of lead lotion, constantly applied, and that is an excellent way of treating other forms of psoriasis in association with a tar lotion. The liquor picis, which is the old liquor carbonis detergens, should be scrubbed into the skin with a stiff brush, and then the limb should be wrapped up in a glycerin and lead solution, and the whole covered up with oiled silk. In this way the most obstinate patches are rapidly improved. The large patch on the back of this man would get better quicker and more readily with that than by any other treatment, but it necessitates the patient lying up. While it is not a very pleasant treat-

ment if used over a very large surface, it is extremely efficacious, and a large number of cases yield and improve rapidly. After the great bulk of inflammation has been reduced by such means the author very often applies chrysarobin pigment. Chrysarobin may be used in almost all chronic patches and in various strengths, according to the hyperemia—10 to 30 grains to the ounce. Stronger applications than that must be used with care, and must not be trusted to the patient himself. The applications should only be made under observation, so that if there is erythema set up the drug can be stopped and means adopted to subdue such inflammation. It may sometimes be used in more acute inflammations in very small quantities—½ to 5 grains to the ounce of plain oxide of zinc ointment, or sometimes only lard. Some of the more acute cases do extremely well with this.

THE INFLUENCE OF DIGITALIS, STROPHANTHUS, AND ADRENALIN UPON THE VELOCITY OF THE BLOOD CURRENT.

As the result of a research reported in the *American Journal of Physiology* for February, 1907, EDMUNDS concludes that the members of the digitalis series produce an acceleration of the blood stream followed by a retardation, which appears under larger doses of the drug. In the greater circulation the peripheral stream is accelerated, while in the portal area there may be a similar effect if these vessels are not strongly contracted. If there is a very great contraction here, as shown by a marked rise in blood-pressure, the portal stream is probably retarded, although a certain amount of resistance may be overcome by the increased efficiency of the heart. In some animals the only demonstrable effect of adrenalin on the current is great slowing, probably due to the greatly increased blood-pressure.

The acceleration of the blood stream which is produced by many of the series during the early stage of their action may possibly explain some of the benefits derived from their administration. The fact that the blood is flowing more rapidly through the tissues would indicate an improved blood supply, giving not only more nourishment, but also providing for more complete removal of waste products. This does not overlook the benefits derived from the characteristic action of the series upon the cardiac muscle itself.

THE USE OF ADRENALIN DURING ETHER ANESTHESIA.

VENABLE tells us in the *Virginia Medical Monthly* of February 22, 1907, that some time ago in giving ether to a young man who was to undergo an operation for oblique inguinal hernia, he experienced more trouble from a profuse bronchorrhea than ever before. At the commencement of the anesthetic the patient's respirations were clear and regular, his color was good, and his pulse 84. The anesthesia was, as usual, begun with nitrous oxide gas, followed by ether, using a Bennett's inhaler until etherized, when a towel cone was substituted. Very shortly after the ether was begun the bronchial secretions were markedly stimulated, and so rapidly increased that in ten minutes there was a profuse bronchorrhea. The pulse increased in rapidity and lost volume, respirations became shallow and irregular, and the patient cyanotic. The moment the ether was withheld the patient promptly offered resistance, and when more was administered his breathing was so interfered with by the great flow of mucus that at times respirations ceased.

After trying all the usual methods to continue the anesthetic under these trying circumstances, the author ordered a 5-per-cent solution of adrenalin, and with this mopped out his pharynx. Almost immediately the secretion of mucus became less, the respirations clearer and deeper, and the patient less cyanotic. In a few minutes, however, there was a threatened return of the profuse secretions with the accompanying cyanosis, but by the use of the adrenalin this was again averted. In twelve minutes from the time the adrenalin was first used the throat was clear of mucus, respira-

tions were deep and regular, and all embarrassing symptoms had disappeared. After this a few drops of the adrenalin solution were occasionally poured into the ether cone, and the anesthesia was carried on to an uneventful termination. With the improvement in respirations the pulse steadily improved, becoming regular and full. The recovery from the anesthesia was quick and satisfactory. The patient vomited once, but complained of no subsequent nausea.

With this encouragement the author determined to use adrenalin with his anesthesia as a routine in a series of cases. This he did, and arrived at the following facts:

He found that a 25-per-cent aqueous solution of the standard 1 in 1000 gave the best results, and that by first pouring ether in the towel cone and spraying the adrenalin solution on it, depending on the ether to vaporize it sufficiently for inhalation, was the best mode of administration. Three- to six-minute intervals are sufficient for its use, and a total of from one-half to one ounce of this solution is enough for an operation lasting from thirty minutes to an hour. The effects are a more uniform etherization, the pulse becoming steadier, slower, and of better character more rapidly than under ether alone; respirations are quiet and regular, the bronchial secretions are practically checked, and the progress is not interrupted.

These cases were not selected, and among them were old alcoholics; two women over sixty, one of them nearly eighty years of age. Three were very long, tedious operations, lasting over two hours, and in none of the series was any stimulation required during the anesthesia.

Recovery from the anesthetic was uniformly good; there was practically no postoperative shock, and no stimulation was needed in any one of the cases; only two patients vomited at all, and very little nausea was complained of.

From the foregoing facts the author concludes that owing to the contraction of the smaller vessels the bronchial glands secrete less mucus, and there is better aeration in the bronchioles and pulmonary vesicles, less ether is required to produce anesthesia, and there is less probability of ether pneumonia following. The adrenalin, acting generally from absorption, is a powerful stimulant; it materially lessens shock, lessens the capillary ooze at the field of operation, and is of great benefit to the much weakened patient.

INJECTION OF MAGNESIUM SALTS IN TETANUS.

MELTZER and AUER in the *Journal of Experimental Medicine* of December 21, 1906, in writing of this plan assert that the three cases reported by them show that in human beings the intraspinal injection of magnesium sulphate is capable of abolishing completely for quite long periods the severest symptoms of tetanus. In one case it was apparently the means of saving the patient's life. That the other two patients died while their muscles were in a perfectly relaxed condition may be taken to indicate that tetanus toxin has other poisonous effects besides those which produce the tetanic symptoms. Since, however, other interpretations are possible, they cannot enter here into a discussion of this subject.

They believe that intraspinal injections of magnesium sulphate, in doses which do not affect the respiratory center or other vital function, are capable of abolishing completely all clonic convulsions and tonic contractions in cases of human tetanus, and experimental tetanus in monkeys. The relaxing effects of the injections may last twenty-four hours or longer.

In experimental tetanus in monkeys early intraspinal injections of magnesium salts are capable of retarding the progress and development of the tetanic symptoms.

THE CARE AND TREATMENT OF INEBRIATES.

In the *Journal of the American Medical Association* of February 23, 1907, BUTLER writes upon the management of inebriety. This is treatment of a protracted disorder like typhoid, where any "specific" becomes an absurdity, since the patient, and not the

disease, requires treatment. Strychnine is beneficial in nearly all nerve defects, because it enhances general circulation, gives tone to the heart, and adds a certain buoyancy which offsets depression. For this reason strychnine and nux vomica have often been credited with curing inebriety. The author prefers strychnine nitrate 1/100 to 1/50 grain three times a day, either in solution or in pill. Other preparations useful occasionally are the hydrobromate of strychnine 1/50 grain, and arsenate of strychnine 1/100 grain, once or twice daily. Other good tonics for chronic alcoholism are the following:

℞ Tr. nucis vomicæ, f3ss;
Acidi phosphorici dil., 3j;
Aquæ chloroformi, ℥j;
Aquæ dest., q. s. ad ℥vj.
M. Sig.: A sixth part three times daily.

℞ Tr. nucis vomicæ, 3iv;
Acidi nitrici diluti, 3v;
Fluidextracti leptandræ,
Fluidextracti taraxaci, ää f3vj;
Infusi quassiæ, q. s. ad ℥viij.
M. Sig.: Two teaspoonfuls in half a glass of water two or three times a day.

Mandragora is an old remedy for conditions of depression, and as it undoubtedly adds a certain nerve-toning element to a decided eliminative tendency, there is no doubt that at times it would prove beneficial in certain cases of inebriety. Its nerve-toning and resultant sedative process, as well as its eliminative action, however, are greatly overestimated. It has an action on the heart resembling that of digitalis, but has not quite the tonic effect on the arteries of strophanthus, with which it has been allied. It was a great favorite with the Greek and Roman alienists, and their claims for it have been revived in St. Louis, the home of proprietary preparations. Like all the nervous exhaustion states, inebriety is accompanied by motor disturbance. The inebriate requires restful sleep. Combinations of sulphonal, of trional, of veronal, and tetronal with old vegetable narcotics, like passiflora incarnata, hyoscyamus, conium, etc., are frequently beneficial for this purpose. The following is an excellent formula to produce sleep in these cases:

℞ Sulphonal, gr. xviij;
Fluidextract conii, m. xviij.
Pulv. glycyrrhizæ, q. s.
Ft. caps. No. vi. Sig.: Take two at 6 P.M., two at 8 P.M., and two at 10 P.M. The next night half this quantity will probably suffice.

Lupulin in 10- or 20-grain doses taken at bedtime will often serve as an efficient hypnotic.

Balneotherapy, on account of the stimulus of the circulation, is peculiarly beneficial in all its varieties. Cold sponging, giving in such a way as to reach the spinal and pelvic nerves, exercises a beneficial influence in many directions. In diet, red meats must be greatly reduced as well as the starches, while the fats should be increased. Food, as a rule, should be given frequently in small quantities, but should be very nutritious. Fresh acid fruits are of great value.

In regard to moral treatment the inebriate must place himself under medical control for a prolonged period; otherwise results will not be permanent. Separation from the family and from the previous environment in which the condition has developed is absolutely necessary in the vast majority of cases.

THE PROPHYLAXIS OF SCARLATINAL NEPHRITIS.

In an article bearing this title in the *Edinburgh Medical Journal* for February, 1907, THOMPSON reaches the following conclusions:

1. Scarlatinal nephritis is a distinct part of the disease, and should not be looked upon as an inevitable sequela, which presents itself in a certain percentage of cases; and as such it should be open to treatment.

2. The cause of scarlatina is an organism, but of what particular variety sufficient evidence has not been given to determine it.

3. The only form of treatment that is likely to be of any real value in counteracting the nephritis is the prophylactic, the object being either to kill outright, or to weaken the virus by a substance which is in itself harmless; and as the virus is in the general circulation at the beginning of the

disease, it must perforce be present in the kidneys and urinary system.

4. The diet and general medical supervision of the patient should be strict. A milk and farinaceous diet should be insisted upon for the first three weeks, during which time patients should be kept in bed; they should be in the house for the two weeks following, and care should be taken until **desquamation** is completed. Patients should be encouraged to take plenty of diluents as long as there is no evidence of fluid collecting pathologically in any part of the body.

5. All methods of excretion should be encouraged and helped in every way possible. Thus the fauces should be frequently swabbed gently and gargled with sodium bicarbonate solution to remove mucus, and this should be followed by a weak antiseptic solution—*e.g.*, chlorine water. A Higginson syringe should be used when gargling is not feasible, but care should be taken that it is not done too forcibly, to cause the extremely infectious tonsillary exudate to be driven up the Eustachian tubes, as the child splutters and swallows. Desquamation should be encouraged by frequent sponging and occasional tepid baths, to prevent a clogging of the exits of the sebaceous glands with partially shed epithelium. Constipation should, of course, be avoided, but purging lowers arterial tension and should be guarded against; for a low arterial tension is detrimental to diuresis, which should be encouraged. Rather above than below the normal amount of urine should be the guide. A frequent examination of the urine should be carried out.

6. With regard to the use of a prophylactic drug against the nephritis of scarlatina, the only one that has proved itself to be of any value is urotropin. It is true that urotropin had the distinct advantage of being used in cases in August and the first eighteen days of September, which is a time that the nephritis percentage is usually low. But the fact that of the forty-seven consecutive cases treated with urotropin not one had nephritis, and only one had albuminuria, is, in the author's opinion, encouraging enough to suggest the further use of the drug in scarlatina.

7. And therefore, finally, he suggests that all cases of scarlatina should be treated from the beginning with 5-grain doses of urotropin thrice daily for children up to twelve years, and for patients above that age 7½ grains thrice daily. In the administration of the drug, the importance of dilution with water must not be overlooked; and the author recommends that this treatment should be continued to the end of the twenty-eighth day of the disease.

AN EXPERIMENTAL RESEARCH INTO THE RESUSCITATION OF DOGS KILLED BY ANESTHETICS AND ASPHYXIA.

CRILE and DOLLEY in the *Journal of Experimental Medicine* of December 21, 1907, make a report on this subject. In regard to the solution employed for infusion, their observations as well as other researches within the past year have led them to conclude that Ringer's solution yields more favorable results than saline solution. The most satisfactory results were obtained with the infusion bottle at a height of five or six feet.

On the data supplied by these researches and those of preceding researches on similar lines they arrive at the following conclusions:

1. Animals after death from chloroform, ether, or asphyxia up to five minutes were uniformly and readily resuscitated; up to ten minutes there was an occasional failure; beyond ten minutes consciousness was rarely restored, and the proportion of successes in the resuscitation of the circulation and the respiration diminished with the lapse of time; after twenty-three minutes in adult dogs and thirty-five minutes in puppies complete return of the circulation was not accomplished.

2. After death from chloroform and ether animals were more readily resuscitated than after death from asphyxia.

3. Resuscitation, if successful, occurred within one minute after the administration

of adrenalin in the majority of instances; it rarely occurred after an interval greater than three minutes.

4. The greatest difficulty to be overcome was clotting. The probability of clotting increased in direct ratio with the lapse of time after death. Cardiac trauma predisposed to clotting.

5. The younger the animal, up to certain limits, the more readily it was resuscitated.

6. Any artery may be used for the infusion, though the advantage is probably slightly in favor of the carotid. The infusion should be directed toward the heart.

7. The probable success of resuscitation is greater in inverse relation to the lapse of time after death; a rapid rise in the arterial pressure is attained by arterial infusion with a therapeutic dose of adrenalin, together with good artificial respiration and the avoidance of unnecessary cardiac trauma by massage. All artificial aids should cease as soon as the functions are competent.

REPORT ON THE TRYPSIN TREATMENT OF CANCER.

In the *Boston Medical and Surgical Journal* of January 3, 1907, GRAVES gives a valuable report on this topic. He concludes that a discrete cancerous node systematically attacked by injections of trypsin shrinks and becomes hard and fibrous or disappears.

Second, neighboring nodes are little if at all affected, and are probably influenced only when the trypsin comes into actual contact with the growing cells.

Third, the treatment of a given node causing it to shrink or disappear does not prevent the appearance later of another node in immediate proximity to it.

Fourth, there is no evidence in these cases to show that trypsin affects cancer cells by circulating in the blood, or that it affects them in any way excepting by direct contact.

Fifth, the internal administration of the various ferments of the pancreas is of benefit to cachectic patients; but from the author's experience there is nothing to show that this benefit is due to anything else than the assistance given to the intestinal digestive secretions of the individual patient.

Sixth, the direct action of trypsin on growing cancer cells, as shown clinically and microscopically, is sufficient warrant to continue the treatment in inoperable cases, especially in view of the fact that there are apparently no serious results that can occur from its use.

THE DECHLORIDATION TREATMENT IN CARDIAC AND RENAL DISEASE, OBESITY, ETC.

GUBB in the *Clinical Journal* of January 2, 1907, in speaking of this plan of therapy says that the dechloridation treatment comprises two principal indications: one is to rid the organism of the surplus chloride and water; the other is to so apportion the ingestion of chloride as to maintain the intake at a slightly lower standard than the output.

It is easy enough to calculate the intake; milk contains 1.60 gramme per liter, bread 8 to 15 grammes per kilo., and meat about 1 gramme per kilo. (Chloride-free bread may contain as little as 1 gramme to the kilo.) A mixed chloride-free diet represents approximately 1.5 gramme of salt per day.

A patient under the dechloridated diet is regularly weighed, and when the weight has become stationary, showing that the process of dechloridation is complete, we may cautiously add salt to the diet, in order to ascertain the limit of permeability of the kidney. As soon as we exceed that limit there will be a gain of weight consequent upon retention and hydration. The suitability or otherwise of the diet, therefore, does not depend upon its nature, but upon its richness in salt, a fact that cannot be too strongly insisted upon.

The advantage of the chloride-free diet is that we can compile a dietary in accordance with the taste of the patient. He may take, says Widal, saltless bread; meat, either raw, grilled, or roasted; fresh-water fish, eggs, butter, and cream, along with

any kind of vegetable (especially potatoes); rice, salads, etc.; sweetmeats, pastry, fruits, jam, chocolate, etc. The absence of salt may be masked by using other condiments. As Widal points out, the treatment naturally will not obviate all the accidents to which renal and cardiac patients are liable at advanced stages of disease, but it may at any rate enable us to conjure certain complications which would otherwise kill the patient, and we can devise a regimen more in accordance with his habits.

Labbé and Furet investigated the "chloride balance" in obesity, and found that in most cases there was decided retention, in one case to the amount of 102 grammes, in another 47.5 grammes. They remarked that some time elapsed before the tissues became hydrated in proportion to their richness in salt, and the same disjunction was noticed in the course of chloride elimination. These observations have an important bearing on the treatment of obesity. For instance, the deprivation of fluid, which forms part of most antiobesity regimens, tends to increase the proportion of chlorides in tissues, and when this has attained a certain pitch the organism reacts and seeks to retain as much fluid as possible, whence a marked reduction in the amount of urinary secretion. The best results will be obtained by a comparatively chloride-free diet, associated with the necessary restrictions in the matter of food in general.

As it is necessary to make repeated analysis of the urine, in order to determine its richness in chloride of sodium, it may be well to describe a summary method introduced by Ekehorn, of Berlin, which is sufficiently accurate for the purpose. He makes use of a test-tube 22 centimeters long and 15 millimeters in diameter. This marked as follows: The first mark from the bottom, "U," indicates a capacity of 2 Cc.; the next, marked "I," indicates 1 Cc. more, the rest of the tube being graduated in cubic centimeters; the third mark from the bottom being marked "O," and the rest 1, 2, 3, etc.

The test solutions are the following:

1. Sulphocyanide of potassium, 0.332 gramme; distilled water, 40 grammes; concentrated solution of iron alum, free from chlorine and ferric sulphate, q. s. to make 100 Cc.

2. Nitrate of silver, 5.815 grammes; nitric acid, free from chlorine, 50 Cc.; distilled water, q. s. to make 1000 Cc.

Each cubic centimeter of the nitrate solution corresponds to 1 per 1000 of NaCl in the urine, and can be read off on the tube.

Pour in 2 Cc. of urine (to mark "U"), then 1 Cc. of the No. 1 solution (to mark "I"), then add the silver nitrate solution drop by drop until the precipitate is completely decolorized—*i.e.*, has a gray tint—and the liquid has lost the color of the sulphocyanide. Then read off the result. Albuminous urine must be first boiled. The limit of error with this procedure is .25 per thousand.

THE HYOSCINE SLEEP IN OBSTETRIC PRACTICE.

BIRCHMORE, in the *Medical Record* of January 12, 1907, tells us that since the rediscovery of the conditions under which the deep sleep, resembling death in its soundness, of which the tradition had come down through the ages, could be produced, men in various parts of the world have made use of it to obtain insensibility to pain. A few have made use of it in the practice of the obstetric art, and some have furnished the writer notes more or less complete of their experiences. From their notes he has gathered certain facts which he has used to form the material for this thesis, which may be considered, he believes, as a statement of the conditions in fact and in practice, on which that great improvement in the obstetric art for which we have long been looking may reasonably be grounded.

The actual results which have been attained may be summarily stated in very few words: The patient slept, labor came on and progressed in accord with usual conditions, normally in relation to the details. The labor was not prolonged, far other-

wise; and in no case was it needful to use an anesthetic, although the forceps was used twice. The only case in which the mother showed any signs of awakening was not one demanding interference. No results influencing the infant unfavorably were observed, although most anxiously looked for. Such is a summary of the results, but that this summary may be duly appreciated it is well to consider the whole proposition, theorem, and demonstration in detail. The hyoscine was administered hypodermically in doses of 1/100 grain, in combination with morphine, ¼ grain. This amount was given in solution in 1 Cc. of water, and repeated as required. Much stress is laid upon the absolute purity of the ingredients for reasons which are obvious, but it is of special moment when so small a dose as that of hyoscine is used that the nearest possible to absolute purity should be attained.

As a rule the remedy was given hypodermically, but in one instance the first dose was given per os, and, except for a delay in taking effect, no change from the normal was seen. The first dose was given as soon as the first stage of labor was certainly begun, and was in most cases sufficient to hold the patient until the so-called expulsive pains were distinctly pronounced. The instant the patient began to show the least evidence of perception the second dose was given. In the cases requiring the aid of the forceps a third dose was given in two instances, but not in the third case, and probably the second forceps case did not really need the third injection.

The effect upon the patient does not show the variation which might in some sense have been expected, so far as the depth of the sleep and the length of it is concerned, nor did the doses have the cumulative effect which might have been expected. On the question of the length of the nap one group of cases suggests six hours as the normal duration, while another group gives eight hours from the time the second dose was given. But in the case in which there was an eight-hours' sleep, the time between the two doses was less than in those in which the sleep was for six hours. The exact relation between the doses and the length of the nap is still very indeterminate.

LUXATION OF THE ULNAR NERVE.

Two forms of luxation are recognized by ROSENBACH (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv), complete and incomplete. In the former the nerve slips entirely over the inner condyle and comes to lie in front of this; in the other it merely rides outward on it.

These displacements cause no annoyance unless the ulnar nerve is inflamed, in which case recovery is interfered with. The absence of symptoms is shown by its frequency, about ten per cent of all persons showing incomplete and over one per cent complete dislocation. The condition is due to looseness of the fibrous tissue behind the elbow, to small size of the epicondyle, abnormally great angle between the arm and forearm, and large size of the triceps tendon, which tends to push the nerve out of place. The displacement only occurs when the arm is flexed, the nerve returning to its position on extension. It may be replaced without difficulty, or may be fixed in its abnormal position as long as the arm is flexed. Treatment consists in exposing the nerve and sewing the soft parts over it so as to hold it in position. In a case reported by Rosenbach, he also cut the groove behind the condyle somewhat deeper.

SILVERIZED CATGUT.

BLAKE (*Annals of Surgery,* January, 1907) strongly commends the method of preparing catgut below described in that it renders this substance not only sterile but slightly antiseptic, and without adding to its irritating qualities or lessening its tensile strength. Four coils of catgut, each containing ten strands, are wound on four glass slabs and placed in a jar containing two-per-cent solution of collargolum, in which they remain for a week, the jars being shaken once or twice in the interval. The slabs are removed, washed in sterile water

until the excess of collargolum solution is removed, and placed in 95-per-cent alcohol for fifteen to thirty minutes. After this the separate strands are wound on separate spools, under aseptic precautions, and preserved in 95-per-cent alcohol until used. Four coils are employed as a unit, as they exactly fill the jar containing the collargolum solution; and as many jars are prepared at any one time as may be necessary.

Pilcher states that he has used Blake's method in more than 500 operations and is abundantly satisfied with it. Moreover, he says that during this period there has been a notable absence of infective accidents such as occur in an active general service.

PROSTATECTOMY.

WATSON (*Boston Medical and Surgical Journal,* Feb. 14, 1907) exhibited at the Boston City Hospital two cases on which he had performed prostatectomy by the perineal method. He states that he has been connected with the operative treatment of the prostate longer than any one in this country, and was the sole and only surgeon for a good many years to be found who advocated prostatectomy, and especially perineal prostatectomy, and he has seen the recent development of the various techniques of the latter procedure, each and every one, and has practiced some of the more important and promising of them, as well as the one he employed long before any of them were put in the field. He therefore speaks with some authority when he states that it does not make the least difference which of them is employed so far as safety or danger of the operation is concerned. Whichever one is preferred by any individual surgeon, and whichever one of them he is most skilled in performing, that is the one he had best adhere to.

Those operations which afford the best chance of avoiding injury to the ejaculatory ducts and the floor of the urethra are to be preferred to those which do not aim at doing this. It has yet to be shown that any serious harm or inconvenience comes from tearing through the sides of the prostatic urethra, which he does in every case of perineal prostatectomy in which he follows the operation he has done for the last eighteen years.

This operation be believes to be the most rapid of all methods. He has removed the prostate in two minutes and without any more risk to the patient than if he had occupied half an hour. The time taken averages about six to eight minutes, and is often as short as four minutes. It consists in enucleating the prostate lobe by lobe or in one mass, as may be preferred, with the finger-tip, aided when necessary by snipping especially tough fibrous connections between the surface of the gland and the inner surface of the outer sheath with blunt scissors.

The finger is passed into an ordinary external perineal urethrotomy incision and into the prostatic urethra. When there, one side and later the opposite side of the prostatic urethra is scratched through with the finger-nail or incised with a gum lance passed beside the finger, in either case above the urethral floor, and consequently above the entrance of the ejaculatory ducts and above their course through the posterior part of the prostate itself. Through these openings in the sides of the prostatic urethra the finger-tip bores until it rests upon the surface of the thin capsula vera covering the gland and forming a part of it. The enucleation is then accomplished by working the finger between this membrane and the outer sheath of the prostate. It is essential that this outer sheath should not be wounded, for in it lie the prostatic plexus of veins which are the source of all the bleeding which occurs in the course of this operation or of any other way of removing the prostate. Hemorrhage need never occur if care is taken to avoid injuring this structure. Personally Watson has never had a hemorrhage of the least consequence in any of these operations, of which he has up to the present time done 74, 54 of them being perineal prostatectomies. Perineal operations have been criticized because of what is asserted to

be the greater danger of wounding the rectum when performing them than in the suprapubic method. As a matter of fact the rectum need never be wounded if only the operator will take the precaution to place two fingers, of the hand not engaged in the enucleation, in it and press upward against the posterior surface of the prostate whenever the enucleating finger presses downward toward the rectum.

In regard to the advantages and disadvantages of the perineal and suprapubic operations there can be practically very little to choose between them, were it not for the one persistent fact that at the very best showing the high operation has an operative mortality of 7.6 per cent and an average one of 11.6 per cent, while the best of the series of the perineal operations is but 2 to 4 per cent and an average of 6.5 per cent. The operative mortality of both operations is gradually diminishing.

HABITUAL DISLOCATION OF THE SHOULDER—TREATMENT.

Habitual dislocation of the shoulder is ordinarily the sequel of an original dislocation by force, and PERTHES (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv) believes that it is generally due to fracture of the articular portion of the humerus or scapula, which has not united properly.

In most cases the condition results from loss of the support afforded the capsule by the tendons of the supra- and infraspinatus muscles and the subscapularis. The insertion of their tendons in the greater tuberosity renders this very liable to fracture by muscular action or by trauma when the shoulder is dislocated. In some cases the tendons themselves give way near their insertion. The ruptured tendon is likely to unite with the capsule of the joint. In other cases the original injury has resulted in tearing off a piece of cartilage from the edge of the glenoid cavity, this piece being often found as a loose body in the joint. The articular surface may be broken almost in half. In still a few cases no bone lesion could be found, and the condition was apparently the result of relaxation or rupture of the capsule. *X*-ray examination will often show the nature of the lesion, and several pictures should be taken from several directions and with the arm in external and internal rotation. The fragment of the tuberosity is usually easily found, and may be as much as an inch away from its original position. It varies in size from a tiny fragment to the entire tuberosity. The tuberosity shows best by exposure from behind with the arm rotated outward. Comparison with the sound side will then show an irregularity in the contour of the upper end of the humerus and an apparent loss of height as compared to breadth. Irregularity of the glenoid cavity can also be recognized, but free bodies are not always seen. On this account no operation should be performed without opening the capsule. The capsule is normally so large that it will hold two heads of the humerus or permit subcoracoid dislocation. It may be found enlarged throughout or with an enlargement of the anterior portion resembling a hernia.

The treatment of habitual luxation formerly consisted in excision of the head of the humerus, and although this often prevented recurrence it frequently left a stiff joint. Suture of the enlarged capsule with reduction in the size is more logical, but does not guard from recurrence on slight trauma. If the tuberosity is fractured or the tendons torn off from it, the injury must be repaired, or the joint will not be secure. The best method of joining the ruptured tendons to the bone is by means of double-pointed steel tacks. These are either driven through the tendons into the bone, or are first driven into the bone and the tendon then sutured to them with strong sublimate silk. The glenoid ligament may be fastened in place in the same way, the double tacks being driven into the neck of the scapula.

To determine accurately and treat properly these conditions, it is essential that the joint be thoroughly exposed. A skin-muscle flap, including the entire deltoid muscle, is drawn backward and upward.

This exposes the joint very well, and the muscle does not suffer from the disinsertion, if sewed in place firmly. The joint may be reached from in front by an incision along the border of the deltoid muscle, the anterior portion of which is severed near the clavicle. The tendon of the pectoralis major is cut, and this muscle is drawn toward the breast. Then with a Gigli saw the end of the coracoid process is removed and the coracobrachialis and short head of the biceps drawn down. The upper border of the subscapularis may be drawn back or severed. After suturing the tendons of the scapular muscles and repairing the glenoid ring, the capsule is drawn up with sublimate silk which is so placed as to strengthen it. The muscles cut during the operation are then restored and the skin closed.

FRACTURE DISLOCATION OF THE SPINE.

LLOYD (*Medical Record,* March 23, 1907) calls attention to the fact that concussion of the spine may cause a certain amount of anesthesia and paralysis, and that immediate operation in such cases is unwise. It is impossible in the first few hours to determine with any degree of certainty how severe the injury really is; even though the cord be injured absolute localization is not practicable. Therefore the surgeon should wait until this period of shock has passed, and until it is evident that there will be no spontaneous recovery complete enough to render life bearable. If, after this period is passed, the patient continues to improve no operative interference should be considered, but as soon as symptoms begin to show retrograde phenomena or seem to have reached the end of improvement, operation should be undertaken.

Of 27 fracture dislocations of the cervical region operated on immediately it is noted that 21 died and but two improved. Of 10 operated on at a later period only two died.

In order to make the operation perfectly successful it is essential to remove enough laminæ to make sure that there is no compression of the cord, to chisel off any projecting bone, to remove all blood clots, and even though laminæ of sound vertebræ have to be removed, to go beyond the hemorrhagic area and to look out for thickening or pressure resulting from inflammatory processes or injuries of the structures within the vertebral canal. Care should be taken that the cord dilates to its full extent, and that the pulsation returns. This can happen only when the cord has not been completely destroyed. The intradural hemorrhage calls for removal of the clot, since there is a possibility of regeneration, providing compression is removed at a sufficiently early period.

Lloyd holds that the dangers of operation are very slight compared to the possible benefit, and the typical symptoms of a complete transverse lesion are not infallible. Hence the surgeon is not doing all in his power to relieve the patient's condition unless he operates. As a rule operation can be delayed a few hours until the concussion effects have passed away. He states that none of the cases that have been reported up to the present time as instances of regeneration of the spinal cord have demonstrated the slightest sign of actual regeneration. Although all of them have been reported as complete transverse lesions, in none of them has this been proven, and it is more than likely that there have been nerve fibers that were not destroyed and that have recovered their function. His own experience relates to two cases in which there was apparent complete transverse section of the cord, and in both the whole of the pulpy mass was removed, and a suture applied bringing the severed ends of the cord in apposition. Neither showed the faintest sign of regeneration.

The author suggests that until we have a sufficient number of cases from which to draw conclusions all of the fracture dislocations of the vertebræ should be submitted to the surgeon for operation. He advocates the plan of approximating the cord as suggested by Haynes (*New York Medical Journal,* Sept. 22, 1906), but warns operators against making a complete section of the apparently destroyed areas, for fear

of cutting out nerve fibers that are not involved in the destructive process and that may resume their normal functions. The author states he has performed laminectomy thirty-two times, and although some of his cases have improved to a marked degree, a very considerable number have shown absolutely no benefit from the operation. In none can he attribute improvement to regeneration.

Haynes gives the following technique for laminectomy: The incision should be in the median line, 4 to 6 inches long, exposing the spinous processes and laminæ for at least five vertebræ, the center one being the seat of injury. With rongeur forceps the spinous processes are bitten off at their bases. The spinal canal is opened first in the middle line and then laterally, removing the laminæ and intervening ligaments. Time spent in plastic work is wasted. If the cord is severed it should be sutured. The wound is closed after primary union over a drain of several strips of rubber tissue or strands of silkworm-gut, and a plaster cast is applied. Drainage should be removed in twenty-four to forty-eight hours. Paralytic symptoms are thereafter treated by massage, electricity, or passive motion continued for an indefinite period. After three or four weeks of treatment in bed a new plaster jacket should be applied with a Sayre's extension tripod or after the horizontal hammock plan. This should be worn and changed as often as necessary for several months. Such a support should be worn for at least a year after a laminectomy for a fracture dislocation.

THE TREATMENT OF GUNSHOT WOUNDS.

On the basis of experience gained in the Greco-Turkish war, FESSLER (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv) gives his approval to the idea of not interfering with such wounds unless there is good reason.

In case the bullet remaining in the tissues does not press upon an important organ or nerve it should not be removed. No probing should be attempted in a desire to locate the foreign body. If it is necessary to open the wound deeply on account of bone necrosis or deep abscess, the bullet should be removed if it is easily found, but no operation should be performed for the removal of a missile which is causing no trouble simply because it can be located easily. The principle of non-interference is of especial value in regard to wounds in or about the joints. Such cases should be put at once in a non-fenestrated plaster cast. In no case should a fresh wound or one which is not already infected be washed. A dry antiseptic dressing, iodoform or sublimate gauze, should be applied and the wound closed tight. Shot wounds are ordinarily sterile until germs are introduced by probing or douching. Moist dressings are to be avoided, as they interfere with the formation of a firm clot, the wounds which heal under a clot doing best. Even penetrating wounds of the chest and abdomen are best treated expectantly until some indication for operation arises. Several cases are reported in which a ball was passed by the rectum after a penetrating wound of the abdomen had healed without a sign of peritoneal infection.

CHRONIC ULCER OF THE STOMACH NOT CURED BY GASTROENTEROSTOMY.

WITHINGTON (*Boston Medical and Surgical Journal,* Feb. 14, 1907) reports the case of a woman forty years old, who had occasionally vomited blood at varying intervals for six years, and had suffered from considerable pain and, intermittently, dark-colored stools. Three years before her operation she vomited about a pint of bright-red blood. She was fed by enema for ten days, then by the mouth, and apparently recovered and remained well for twenty months. Thereafter there was further vomiting of blood, and five months later pain, which lasted for three months, but without hematemesis. The surgeon did at one sitting gastroenterostomy and enteroenterostomy, a plication, and an appendectomy. Two scars were seen on

the surface of the stomach, the pylorus was indurated, and the stomach dilated.

Eight weeks later the patient returned with pain, vomiting, and some bleeding. A second operation was performed, during which some adhesions were broken up and the omentum was sutured to the site of the plication. The gastroenterostomy was found to be still patent.

The patient was discharged in five weeks, and enjoyed an exemption from trouble for eleven months. She then began to pass blood from the bowels and occasionally to vomit it. After six weeks of this she was treated in the usual way for four weeks, and was discharged free of symptoms. Three weeks later she was back again with vomiting of food and occasional slight hemorrhage from the bowels. At the time of the report she was doing well under medical treatment.

This case is of some importance, illustrating the fact, well known to the operative surgeon, that gastroenterostomy, even when performed by the Roux method, is not an absolutely certain and permanent cure for gastric ulcer.

URTICARIA—EXPERIMENTAL STUDY OF SOME CASES.

PARAMORE'S experiments in urticaria receive an added interest when compared with Morichau-Beauchant's investigations as to the origin of the acute circumscribed edemas. The latter worked on the theory that the primary cause of the edemas was defective digestion, whereby substances were created which, circulating in the blood, acted as lymphagogues and caused an active endothelial secretion of serum without necessarily any accompanying vasomotor disturbance. Paramore followed Wright's suggestion, made in 1896, that urticaria was a disease of the nature of a serous hemorrhage, associated with which was a defective coagulability of the blood, due to a diminution of the calcium salts. Wright's method, published in 1905, was used to determine the relation existing between the calcium salts and the coagulability. The calcium content is measured by drawing into a pipette 5 cubic centimeters of fresh blood and 5 cubic centimeters of a solution of ammonium oxalate of various dilutions. If the ammonium oxalate has completely decalcified the blood after the mixture has stood twenty-four hours, no clot forms and the corpuscles sink to the bottom. The calcium content is therefore determined by the relation between the clotting and the strength of the ammonium oxalate solution, and is expressed in terms of ammonium oxalate. The coagulation time is determined by exposing a column of blood 5 centimeters in length and equal in volume to 5 cubic millimeters of mercury to a temperature of 37° C. in a water-bath. The tube is removed after an exposure of thirty seconds, and then at intervals of fifteen seconds. The first appearance of fibrin is taken as the coagulation time.

Paramore states that no absolute normal calcium content or coagulation time can be given, but as the calcium content has been found in non-milk drinkers to be 1/1500 oxalate of ammonium, and the coagulation time to be one minute and forty-five seconds, he used these as standards. He notes in this connection that milk is one of the chief sources of calcium in the diet, and that milk drinkers have an abnormally large lime content and a proportionately accelerated coagulation time.

The seven cases studied were five of urticaria, one of giant urticaria, and one of angioneurotic edema. Tests of the blood, made before giving treatment, showed a diminution of the lime salts in the giant urticaria alone, and a delayed coagulability in one urticaria and the angioneurotic edema. He then administered calcium chloride by the mouth in drachm doses, to increase the calcium content in the blood and to accelerate the coagulation time. In some cases but a single dose was given; in others it was repeated for several days. Repeated tests showed prompt effect. Clinically, all the cases except one showed improvement in the symptoms, and some were cured in a few hours and one after ten days. In one case of urticaria the reverse

experiment was tried of delaying coagulability. Citric acid (8.0) was given three times a day for six days. Under this treatment the urticaria increased. Then the patient took, on his own responsibility, a magnesium mixture to relieve his constipation. The immediate improvement of his urticaria shows that magnesium acts in these cases like calcium, which explains its value.

Paramore concludes from his experiments that the calcium factor in the blood is of primary importance, but inasmuch as the majority of the cases with diminished lime content associated with a defective coagulability do not have urticaria, it cannot be always the direct cause. A frequent cause is defective renal action, which throws extra strain upon the skin. If the skin can excrete the noxious materials easily and quickly, little harm results. If, on the other hand, the noxious materials are very irritating and not easily thrown off, a serous exudate or wheal is produced, or if the irritation is moderate, a papule. Therefore in the true decalcification urticaria a cure may be expected to follow the administration of calcium chloride, considerable improvement in the papular urticaria, but in the other forms there will be no result.—*Journal of Cutaneous Diseases,* March, 1907.

URETHROTOMY—AFTER-CARE.

SWINBURNE (*American Journal of Surgery,* February, 1907) notes that following internal urethrotomy the primary hemorrhage is usually slight, but that if erection occurs there is likely to be bleeding. This is common enough at night, particularly on the second, fourth, and sixth nights following operation. A still more potent factor in causing bleeding is the passage of sounds. Therefore Swinburne has adopted the practice of not passing instruments for two full weeks following internal urethrotomy, nor has he noticed any tendency to stricture incident to this practice. He calls attention to the fact that there are cases of inveterate urethral discharge associated with stricture which admits full-sized sounds but can be detected by a bulbous bougie. In such cases cure can be most effectually accomplished by an internal urethrotomy carried to such a point that the examining bougie will no longer detect a stricture. In some of these cases dilatation without cutting may be continued indefinitely without accomplishing good results.

SYPHILITIC ALOPECIA.

KLOTZ (*Journal of Cutaneous Diseases,* March, 1907) concludes a paper on this subject with the statement that alopecia or loss of hair is not a common or regular symptom of the early stages of syphilis. The slight loss of hair which is constantly taking place in healthy individuals as the result of the physiological change in the hair continues its existence through and beyond the course of syphilis, and must be taken into consideration before attributing to syphilis a loss of hair so slight as to pass unnoted or scarcely attract the patient's attention.

The same rule applies to numerous cases of slight seborrhea of the scalp, which under ordinary conditions would not be considered worthy of notice or treatment.

In a certain number of cases syphilis may be accompanied by a diffuse loss of hair, which may extend more or less over the entire scalp, varying in degree, similar to that observed after other infectious diseases, such as typhoid fever, erysipelas, etc.

In the absence of any discoverable local changes in the skin this alopecia is apparently the result of malnutrition of the hair and the entire skin as part of a general modification of the entire organism by the infection with the virus.

This alopecia is therefore not strictly a symptom of syphilis, directly due to the virus, but rather a complication.

This alopecia is directly dependent upon and in most instances proportionate to the general symptoms, may accompany the second period of incubation, and usually makes its appearance several weeks after the onset of the prodromal symptoms.

Although this alopecia may be very extensive and affect many portions of the

body, it shows a tendency to more or less complete restitution of the hair, unless the patient is too advanced in years or is a subject of hereditary tendency to baldness.

An alopecia occasionally occurs in the form of ill-defined irregular, small, sometimes coalescent patches of baldness, distributed principally over the back and upper portions of the scalp, and giving it a mangy or moth-eaten appearance.

This alopecia is observed almost exclusively in syphilitics, and is so characteristic that with extremely rare exceptions it is diagnostic of syphilis of the affected individual, either acquired or hereditary. It is a characteristic symptom of syphilis, and almost always occurs at a period more or less remote from the time of infection, usually not before the end of the first year and up to the end of the second year. It generally follows a very tedious course, although terminating in restoration of the hair.

In the absence of any discoverable anatomical changes of the skin due to a local specific process, it is very difficult to explain the origin of this alopecia in patches.

ON OPSONINS AND TREATMENT BY BACTERIAL VACCINES.

BUNCH (*Lancet*, Jan. 19, 1907) contributes an article of some length upon this subject in which he calls attention to the fact that destruction of typhoid and cholera bacilli can be brought about by lysins which are present in the corresponding immune sera after artificial inoculation, and that lysins have been assumed to exist in other diseases also. In diphtheria and tetanus antitoxins are employed clinically, which neutralize the respective toxins. Metchnikoff holds that the destruction of bacteria is carried out by the phagocytes alone, and ascribes the whole protective influence to them. It has, however, been shown that these, washed absolutely free from serum and the substance contained in it, have of themselves no phagocytic action on bacteria.

Buchner was able, by chemical stimulation, to cause the secretion into the pleural cavity of rabbits and dogs of leucocyte-containing exudations which possessed bactericidal powers stronger even than those of the blood or serum of the same animals. Under such conditions phagocytosis proceeded very actively. It is therefore difficult to decide as to whether their bactericidal action depended upon phagocytosis or upon alexins or antibodies contained in the exudate. By freezing the fluid and killing the leucocytes it was observed that the bactericidal power was in no degree lessened. Hence it was evident that the bacteria-destroying qualities of the fluid were dependent upon antibodies. Numerous observers have shown the presence in the blood of opsonins, a substance which becomes attached to the bacteria in such a way as to render them capable of absorption and destruction by the phagocytes.

Wright and Douglas assert that opsonins are destroyed by heat and therefore differ essentially from the immune body. In a considerable number of infections specific opsonins have been demonstrated. An increase of the opsonic condition of the blood may be brought about by the injection into the organism of vaccines. Of these the best known is the "old" tuberculin of Koch. The preparation is a clear, brownish fluid, somewhat viscid in the presence of glycerin, and diluted down before use according to the required dose, this dilution being accomplished just before injection by growing the tubercle bacilli in glycerin-veal broth in the presence of a sufficiency of oxygen for from six to twelve weeks, and then sterilizing, evaporating, and passing twice through a Chamberland filter. There results a glycerin solution of the cellular metabolic products of the organisms containing one or more toxic bodies, which may be either of the nature of a ferment, albumose, or alkaloid. This was used chiefly for diagnostic purposes in doses of one cubic millimeter, which in tuberculous patients produces a rise in temperature. If this reaction is absent double the dose is given two days afterward, and if there is still no reaction double the last dose is given after another two days. If the reaction does not show itself after the last dose the patient is probably not tuberculous.

This tuberculin, though sterilized, is much less used for therapeutic treatment than tuberculin Koch T. R., which is prepared from the virulent culture of tubercle by drying, grinding up the bacilli, and by washing and removing the extracellular toxins, which chiefly constitute the "old" tuberculin. The residue is made into an emulsion with distilled water after trituration, centrifugalized, and the supernatant fluid pipetted off. Twenty per cent of glycerin is added to preserve it, and it is standardized so that 1 cubic centimeter contains 10 milligrammes of solid substance. Dilutions can then be made to any desired dose, and these are heated for an hour at 60° C. in capsules so as to kill any possibly contained living bacilli. The dose to begin with is 1/1000 milligramme, usually less. It is injected subcutaneously in a cleanly manner. These injections will cause neither constitutional nor local reaction. The subsequent dosage both in regard to amount given and intervals between doses is regulated by the opsonic index to tubercle. The large doses—*i.e.*, one or two milligrammes —are no longer given.

The elaboration of protective substances in the organism can be induced by chemical substances or vaccines prepared from bacteria other than the tubercle bacillus. The author states that he has injected vaccines of pneumococci, streptococci, and the various forms of staphylococci during the last eighteen months. These vaccines are emulsions of that species of organism which has produced the disease in the patient, and inasmuch as different strains of the same organism differ greatly the vaccine should, when possible, be prepared from a pure culture of that particular organism grown directly from the lesion to which it has given rise in the patient. This is sometimes a difficult matter. Thus in pneumonia a mouse must be inoculated with the patient's sputum, or in empyema with the pus, and a pure culture of the pneumococcus obtained from the mouse's heart blood, and a vaccine made from the emulsion. The emulsion prepared from such a culture must be centrifugalized and standardized so that a certain volume contains the dead bodies of a certain known number of bacteria, plus their products of metabolism. The initial dose must always be small, since patients react very differently, and care must be taken not to induce too marked or too prolonged a negative phase. Inoculation with the vaccine is followed by a period of intoxication characterized by decline in the antibacterial power of the blood, called the negative phase. This is followed by a positive phase, in which the antibacterial power of the blood is greatly increased. For tubercle inoculations this positive phase may be maintained for as long as a month; very often it drops at about the end of ten days. If too large a dose be given the positive phase may not make its appearance at all. The important point in dosage is the use of the minimal dose which will produce a satisfactory response, nor must this be increased until it ceases to produce its effect; nor should it be repeated until its effect is passing off. Since the increase of the opsonic index in the case of local tuberculosis is without avail unless the blood be brought directly in contact with the bacteria, Bier's congestion is a powerful adjuvant to the tuberculin treatment in peripheral lesions.

Bunch further notes that a diminution of the viscosity and coagulability of the blood can be greatly accelerated by the internal administration of decalcifying agents, such as citric acid. Often operative measures are powerful adjuvants.

Bunch states that when the opsonic index to tubercle is above 3.0 a positive diagnosis of tuberculosis may be made. An index to tubercle below 0.8 is undoubtedly abnormal and indicates either a strong disposition to infection, such as is to be expected in a member of a family several of whom have already shown signs of pulmonary tuberculosis, or that infection has already taken place.

An index appreciably above normal means, as a rule, that infection has already taken place, especially if repeated estimations show considerable fluctuations of the opsonic index.

Bunch reports two cases which perhaps show the admirable results to be achieved by combination of injections of tuberculin with the surgical procedure.

CHRONIC URTICARIA AND HYPOTHYROIDISM.

LEOPOLD-LEVI and DE ROTHSCHILD (*Compt. Rend. Soc. de Biol.*, lxi, 35, 1906) think that urticaria is not an uncommon expression of hypothyroidism, and represents the cutaneous localization of an acute intoxication. They give an illustrative case of a woman who suffered from successive daily outbreaks of wheals and erythema. She also complained of irregular menstruation, increasing obesity, fatigue, and sleepiness. The thyroid was increased in size on the right. Two cachets of thyroid extract were given daily with immediate improvement. The patient stopped treatment after nine days, when all the symptoms returned. She then resumed the thyroid, and has taken it irregularly ever since, with the result that there has been no return of the eruption except for a few scattered lesions, especially at the time of the menstrual period.—*Journal of Cutaneous Diseases,* March, 1907.

SURGERY OF THE THORAX.

In many operations on the wall of the chest it is necessary to open the pleural cavity freely, and REHN (*Archiv für klinische Chirurgie,* Band lxxxi, 1) praises the results obtained, under these conditions, by suturing the lung to the chest wall.

The apparatus of Sauerbruch or Brauer should be used when possible, but if it is not obtainable almost as good results may be had if a large, round, curved needle is passed deep into the lung, before the pleura is cut, and the lung thus fixed to the chest wall. After the pleura is opened other sutures are placed in such a way that they do not interfere with the operation. These sutures have the advantage of lessening the tendency to infection, and of limiting this if it does occur. After the operation the pleura must be closed air-tight. This cannot be effected by closure of the pleura only; all the layers of the wall must be brought together, a plastic operation being performed, if necessary. Even expectation of infection does not permit drainage to be used. It is better to seal the pleural sac, and later open it after adhesions have formed. Cases of tumor of the chest wall, in which this method was used with good result, are reported.

PERITONITIS FROM SALPINGITIS IN CHILDREN.

The frequency with which rapidly fatal peritonitis occurring in young girls was associated with salpingitis led RIEDEL (*Archiv für klinische Chirurgie,* Band lxxxi) to go over the histories of his appendicitis operations to see whether any cases had proved to be salpingitis.

He found that 48 girls under ten had been operated on for suspected appendicitis, and of these 8 proved to be peritonitis from salpingitis. Of 348 females over ten, only 6 had salpingitis.

The affection is characterized by a very rapid course and constantly fatal termination. Bacteriologically no gonococci were found, only staphylococci and streptococci. The infection extends from the uterus, but it is not certain how this was infected. There was no suspicion of misuse in any case. The diagnosis from appendicitis is impossible, and no time should be lost in vain attempts to make it, immediate operation being the only hope of saving life. The onset is acute, with fever, abdominal pain, tympanites, apathy, and later cyanosis and rapid emaciation. The examination of the abdomen is inconclusive. On opening it the intestines and omentum are found covered with fibrinous masses or pus. Pus is found in the tube of one side, but the fimbria is free and the tube little enlarged. The uterus is usually red and congested, the external parts normal. The bad prognosis of this condition should lead all surgeons to warn the parents of the possible danger before operating for suspected appendicitis in girls.

EXCISION OF THE RECTUM AFTER TREATMENT.

In contrast to most operations, the result of which depends mainly on the technique employed, the success obtained in removal of the rectum by the sacral route depends mainly on the care given to the patient after operation, and HOCHENEGG (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv) mentions a number of precautions which must be observed if good results are obtained.

These patients must not be permitted to lie on the back, as this causes mechanical closure of the false anus and wound and leads to damming back of secretion, which may be forced into the abdominal cavity, causing peritonitis. After these operations pelvic abscess is not unlikely to follow, and it is therefore dangerous to raise the pelvis, as this may cause the abscess to rupture into the peritoneal cavity. The use of the knee-elbow position when changing dressings is especially to be avoided. An exception may be made in case of prolapse, the foot of the bed being kept slightly raised. The same may be done in case after-bleeding is troublesome. Emphasis must be laid on retention of urine, because an empty bladder may be assumed from the lack of suprapubic dulness. The bladder falls into the space formerly occupied by the rectum, and even when overfilled may not cause any dulness on percussion. Disturbance of the pelvic plexus of nerves interferes with the normal bladder reflex, and retention will often be overlooked unless all patients who do not pass urine within twelve hours are catheterized. Retention is more likely to lead to cystitis than any other condition, as bacteria always penetrate the wall of the bladder from the wound.

The most important question concerns the stools. The later the first stool occurs and the more solid it is the less the danger of infection. In cases with stenosis it is dangerous to give purgatives before operation, as the bowel will not be completely emptied and the liquid stool following soon after the operation will cause infection of the peritoneum. The stool should be delayed as long as possible by administration of 10 drops of laudanum t. i. d. If the wound is sutured this fecal mass must be softened by enemas or the stitches will tear out. The wound is freely irrigated after each movement and then packed loosely with iodoform gauze. In many cases there is an excessive tenderness of the gluteal region after the operation, and great care must be taken not to irritate the part, as reflex contraction of the muscles will tear the wound wide open. After the patient is well it is best for him to empty the bowel as completely as possible at each stool, forcing with the abdominal muscles. Otherwise there will be constant dribbling of feces. If emptying is thorough, a bath sponge kept against the anus will prevent soiling.

LONGITUDINAL FRACTURE OF THE PATELLA.

This rare fracture is considered in detail by MEYER (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv). It is probably more common than stated, as many of the cases show little disability after the injury and are looked upon as sprains. There is usually a history of direct trauma, with severe pain at the moment of injury, and pain subsequently on bending the knee. The person may, however, walk a long distance immediately after being injured. The disability does not disappear as soon as one expects in a sprain, and this may attract the attention of the patient or the physician, and lead to a more thorough examination. If the knee is examined soon after the injury, there will be tenderness of the kneecap and pain in that region when the knee is flexed, not very definitely localized. In most cases the line of fracture cannot be felt on the anterior surface of the bone, but if the patella is pushed outward, exposing the posterior surface, on this a longitudinal groove may be found. Effusion in and around the knee soon follows, and is later accentuated by the callus. It is difficult to obtain satisfactory *x*-ray pictures. The bones of the leg prevent seeing clearly in pictures from behind, so it is necessary to force the patella out and take a view diag-

onally. A fold of the skin may resemble a fracture in its shadow. Prognosis is good, and rest in bed is only required for a few days. Pain prevents overexertion. Suture is rarely required.

THE INFLUENZA KNEE.

An important contribution to the literature of rheumatoid diseases is made by FRANKE (*Deutsche Zeitschrift für Chirurgie,* Band lxxxv) who discusses at length the articular lesions caused by the influenzal virus.

These articular conditions are most often seen in those chronic afebrile states which follow acute attacks of influenza, and which are due to the continued presence of the bacillus in the tissues. These chronic infections may be recognized by a tendency to chilliness and sensitiveness to exposure, with liability to "colds." The throat is characteristic; the anterior pillars and edge of the palate are red, while the vault of the pharynx and the tonsils are not affected. The tongue shows large red papillæ on a grayish coating. There is often a sense of constriction which may even resemble the sensation of croup. The color of the skin is grayish, unlike that of other anemias. The spleen is found enlarged and the heart is irregular or nervous. The influenza bacillus is isolated with the greatest difficulty, but had been found years after acute infection. There are often harsh sounds at the apices of the lungs.

The articular changes are also absolutely characteristic. The knee and small joints of the fingers are most often affected. The bone is inflamed, and in the fingers the paraarticular structures also. The tenderness of the knee is particularly noticeable on the inner condyle—not over a nerve or where any pressure comes on the cartilage. This location is diagnostic. The pain is dull, but it causes a considerable amount of disability. The onset is slow, and there is little or no tendency to permanent stiffness or suppuration. The knee-jerks are increased, although other reflexes are normal. The cases in which pathologic study could be made showed an osteitis with softening immediately below the cartilage. The treatment consists in putting the joint at rest as far as possible, and especially the avoidance of all sudden strains. Heat externally may relieve the pain, and sodium salicylate with antipyrin is of benefit in most cases, especially in those with enlarged spleen. Potassium iodide and various other antirheumatics are of no value. If possible, rest in bed should be required.

ACUTE DILATATION OF THE STOMACH—ITS RELATION TO MESENTERIC OBSTRUCTION OF THE DUODENUM.

CONNOR (*American Journal of the Medical Sciences,* March, 1907) considers at length the subject of acute dilatation of the stomach and its relation to mesenteric obstruction of the duodenum. The condition may develop during an apparently normal convalescence from operation or from severe illness. The dilatation is not dependent upon a single etiological basis, but it seems to have been demonstrated during the last few years that perhaps the most important single cause is the sudden incarceration of the lower end of the duodenum between the root of the mesentery which runs in front of it and the vertebral column behind. Although in most cases the disease has been rapidly fatal, evidence is accumulating to show that in many instances life may be saved by timely recognition and suitable treatment.

The author bases his study on 102 cases, one of which is his own and another of which he reports through the courtesy of Ewing. The age at which the condition develops is most apt to be between ten and forty years, but extremes of three and sixty-nine years have been observed. As to the conditions which have bearing on the origin of the dilatation, 41 per cent occurred after some form of surgical operation, usually upon the abdominal cavity or the large joints. No case of acute dilatation of the stomach followed operation upon that organ. When it follows operation it usually occurs within the first or the second

twenty-four hours, but has been observed as late as two weeks after operation. In 21 cases it has followed some severe or wasting disease, chiefly pneumonia or tuberculosis in its various forms. Several cases have occurred after injuries, after errors in diet, or associated with deformity of the spine. In four cases acute dilatation came on in persons who had previously appeared in perfect health.

The chief and common symptoms are vomiting, pain, abdominal distention and tenderness, constipation, thirst, scanty urine, and rapid collapse. Vomiting is the most constant and most important symptom. It has been present in over 90 per cent of cases. The vomiting is persistent, incessant, profuse. The large amount brought up is surprising. The material is thin, watery, usually greenish, and rarely feculent. The duration of the disease is generally less than five days, but may be as much as sixteen days.

The author has collected 18 fatal cases of acute dilatation of the stomach due to mesenteric obstruction, besides several non-fatal cases which were ascribed to that cause.

The effectiveness of the treatment will depend largely upon the time at which it is begun. When the stomach has become extremely dilated and collapsed, treatment has often been unavailing. If the disease is recognized early enough treatment is in most cases very gratifying in results. The first step is the complete emptying of the stomach with the tube, which should be made to reach the most remote parts of this organ. This should be repeated several times in twenty-four hours. Food or drink by the mouth should be interdicted. The loss of fluid should be made up by saline enemata or by hypodermoclysis. Nutrition should be maintained by rectal feeding. In many cases this is all the treatment that is needed. If the obstruction is due to a duodenal kink or to the weight of a dilated and overloaded stomach, the mere emptying of the stomach and keeping it empty will suffice. If, however, the dilatation is due to constriction by the root of the mesentery, it is necessary to change the position of the patient so as to relieve this constriction. The constriction is produced by the traction of the intestines downward and backward, usually by their being displaced downward and dragging over the brim of the pelvis when the patient is in the dorsal position. Hence the patient must be required to lie upon his abdomen, and if his condition permits it, should assume the knee-elbow position at intervals. Even to lie upon the side has been sufficient in some cases. Inasmuch as a considerable percentage of cases of acute gastric dilatation are due to mesenteric constriction of the duodenum, all cases of such dilatation should be given the advantage of the postural treatment.

FECAL DROWNING—ITS PREVENTION IN OPERATIONS FOR INTESTINAL OBSTRUCTION.

WILLY MEYER (*Surgery, Gynecology, and Obstetrics,* March, 1907) regards Kausch's esophageal narcosis-tube as a most important addition to the armamentarium in operations for intestinal obstruction, believing it to be the only operation at our disposal to avoid the much-dreaded fecal drowning. Briefly the apparatus consists of a rubber balloon through which passes an ordinary soft-rubber stomach-tube. This balloon is 7 centimeters in diameter when fully inflated, and is securely fastened around the tube at both points of passage, the lower being two inches above the eye at the end of the tube. Emerging together with the stomach-tube from the upper end of this balloon, and passing along the same, is a thin rubber tube, which a few inches from the outer end of the stomach tube separates from the same to enter another bulb of exactly the same size as the lower one, thus forming the connection between the two balloons at either end of the apparatus. Upon the opposite side of the outer balloon a small piece of thin tubing is made to project, for the purpose of inflation, which may be done by means of a hand syringe. Before beginning narcosis the apparatus, with the lower bulb pressed

empty and well anointed, is introduced into the stomach. Then the bulbs are distended and the small projecting tube is plugged or clamped. The narcosis-tube is pulled upward until it meets resistance, which means that the lower bulb presses against the cardiac opening, thus rendering it impossible for any stomach contents to pass through the cardia. Every drop has to find exit through the tube. It is necessary to have an assistant control the proper inflation of the apparatus during the entire operation by continuously and gently pulling the tube upward in the same direction during the operation; he will thus guarantee the proper position of the tube.

While the tube is *in situ* the saliva cannot be swallowed. The patient's head should therefore be turned sidewise and the saliva wiped out from time to time. A slight Trendelenburg posture facilitates the outflow of the saliva. The instrument remains undisturbed until the patient has fully come to after anesthesia. If it is properly placed, all the fluid of the intestinal tract, which continuously regurgitates into the stomach during operation, is carried through the tube into a receptacle placed underneath the operating table.

SURGICAL TREATMENT OF TUBERCULOSIS OF THE KIDNEY.

KELLY (*Surgery, Gynecology and Obstetrics,* March, 1907) states that he has yet to see a spontaneous or medical cure in a case in which tuberculosis of the kidney has been clearly demonstrated. Even under most favorable hygienic surroundings he has always noted the advance of the disease. He observes that with rare exceptions tuberculosis sooner or later involves the bladder, and that this may take place early. He holds that disease is always unilateral at the start; if general or miliary tuberculosis be excluded, it is practically always hematogenous in origin, primary tuberculosis of the bladder being extremely rare. Nephrotomy he advises only in desperate cases of pyonephrosis, and this must always be followed by nephrectomy when the other kidney is not tubercular. If both kidneys are extensively involved, nephrotomy is the only procedure feasible. It often effects a remarkable improvement in the patient's general condition. As a preliminary to nephrectomy, nephrotomy may be of inestimable value. Two months is regarded as a long enough period for the patient to rally sufficiently to stand a nephrectomy, which is best done by the intracapsular method. Partial nephrectomy affords a chance now and then of rescuing the bad kidney; it is indicated when both kidneys are involved, and is especially indicated when half a horseshoe kidney is involved.

The operation of widest application, and that which should always be done if possible, is nephrectomy. In the comparatively exceptional case of one-sided kidney tuberculosis, with the other kidney healthy, and no tuberculosis evident in the bladder or elsewhere in the body, no one should dispute the imperative indication to remove the diseased kidney. Such patients often seem to be in robust health and the local symptoms appear trivial, but it should be borne in mind that no case of spontaneous healing has been demonstrated.

Kelly states that he has twenty cases of nephrectomy in which the disease was unilateral and without bladder involvement, or only slight lesions about the ureteral orifice, and that all these cases, without exception, remained in perfect health over a period extending from two to ten years. Hence the proper time for nephrectomy is as soon as diagnosis has been made. When the disease is further advanced, the difficulties multiply rapidly; the likelihood of disease in the second kidney is increased; grave bladder troubles are present, rendering topical diagnosis very difficult or even impossible; perirenal changes occur, greatly adding to the seriousness and dangers of the operation. Out of thirty-six advanced cases Kelly has had four deaths, and five more within periods of from two months to four years. Involvement of the bladder is a marked indication for nephrectomy, since as long as the tubercular kidney pours

down infectious material the bladder cannot be healed, whereas it often yields promptly after nephrectomy.

SURGICAL TREATMENT OF HIRSCH-SPRUNG'S DISEASE.

This affection, which consists in a congenital dilatation of the sigmoid flexure and descending colon, is always fatal, according to ROTH (*Archiv für klinische Chirurgie,* Band lxxxii, 1), unless it is treated surgically.

Several operations have been suggested, but none have given entire satisfaction. Roth treated a case recently by a new procedure. Any operation must be rapidly made, as the children bear anesthesia badly. In the case reported, an incision was made in the middle line of the abdomen, and the distended portion of intestine drawn out. This was brought together into a loop, and the wound closed around it, leaving the loop of bowel outside. Three days later the loop was resected, and twenty-five days later a clamp was applied to remove the spur. The fistula was closed by a plastic operation three weeks later. The results were good. No stricture followed.

TETANUS—PROPHYLACTIC SERUM INJECTION.

The relative frequency of tetanus is largely a matter of locality, according to BUSCH (*Archiv für klinische Chirurgie,* Band lxxxii, Heft 1), who finds that it is very rare in Berlin, only three cases having developed in over 4000 accident cases in the last eighteen years. Twenty-seven cases with developed tetanus were also seen.

Busch does not consider it necessary to use it in all cases of open wounds, as recommended by some. In country districts tetanus may be more common, and it seems to be especially frequent after injuries of the feet in marching soldiers. Most of the cases seen by him had wounds infected with bacteria of putrefaction, and he therefore recommends antitoxin in such wounds. In cases with large contused wounds, in which a large amount of necrosis is inevitable, it is indicated, especially if such a wound is contaminated with earth or street dirt. In cases with large burns or severe frost-bite it is also of value, tetanus being fairly frequent after such wounds, if gangrene occurs. For some unknown reason tetanus is extremely likely to follow wounds with cartridge paper, and all wounds inflicted by firearms at close range, as well as all wounds in employees of cartridge factories, should be injected.

OPERATIONS ON THE POSTERIOR CRANIAL FOSSA.

Tumors of the base of the brain may be safely approached, according to KRAUSE (*Archiv für klinische Chirurgie,* lxxxi, 1), who reports several operations performed in this region.

The occipital region of the brain is best exposed by a flap of bone and scalp, with the base down. The bone flap approaches the middle line as far as is possible without danger to the longitudinal sinus. Upward it extends beyond the transverse sinus and laterally exposes the sigmoid sinus. It is necessary to expose both these vessels. The flap having been turned down, the dura is cut just inside these vessels and also turned down. This exposes the cerebellum, and by leaning the head to one side or the other the posterior surface of the petrous portion of the temporal bone is laid bare, and a small vein passing from the petrous sinus to the cerebellum is ligated and severed. The lobe can then be carefully displaced with the brain spatula, and the facial and auditory nerve roots exposed. If instead of pushing the hemisphere inward we push it more upward, we expose the roots of the tenth, eleventh, and twelfth nerves. Great care must be taken not to tear the pia or the ventral layer of the arachnoid. With care the entire posterior fossa can be explored and any extracerebellar tumors removed. If no lesion is detected by sight or touch, the cerebellum may be incised to a depth of an inch without danger. If, in spite of pressure symptoms, nothing is found, the fourth ventricle may be tapped, to determine the existence of internal hydrocephalus.

REVIEWS.

MODERN MEDICINE: ITS THEORY AND PRACTICE. In Original Contributions by American and Foreign Authors. Edited by William Osler, M.D., and Thomas McCrae, M.D. Volume I: Evolution of Internal Medicine—Predisposition and Immunity—Diseases Caused by Physical and Organic Agents, by Vegetable Parasites, by Protozoa, by Animal Parasites—Nutrition—Constitutional Diseases. Illustrated. Philadelphia and New York: Lea Brothers & Co., 1907. Price, cloth, $6.

We congratulate the editors and publishers upon the appearance of the first volume of what bids fair to be the standard handbook of clinical medicine in the English-speaking world for some time to come. Much has been hoped of it, and no greater praise can be given than to say that it realizes our expectations.

We have no space here to discuss the relative value of the system and the monograph. We will say only that Osler's Medicine is an example of the system *par excellence,* consisting of comparatively short articles by men whose work lends authority to their statements, arranged in a consistent whole. Such a book is more comprehensive than a monograph can be, and yet has little in common with the great library of medical works published under Nothnagel's name, which is not a system as we have come to understand the term.

No work of the character or scope of Osler's Medicine has appeared in English since the publication of Pepper's first System in 1885. Both are complete and systematic presentations of Internal Medicine, and a comparison of the two books is an impressive demonstration of the rapidity with which the art of medicine is becoming an exact science.

Surely in no quarter of a century in the history of medicine have there been so many advances in so many different fields. The period covers the discovery of the tubercle bacillus and the development of bacteriology, great progress in our knowledge of protozoa and other animal parasites, the transmission of disease by insects, practically the whole development of the pathology of the blood, of immunity, and of the morbid physiology of internal secretion. It includes Pawlow's work, the discovery of the *x*-rays, serum therapy, and many other advances that have changed profoundly our ideas of diagnosis and therapeutics. Such a comparison makes us realize that internal medicine has become a subject of such magnitude and complexity that no one can hope to cover the whole field adequately. To do this there must be a collection of articles written by specialists who have been chosen and directed by editors of scientific attainments and clinical experience, and with minds broad enough to perceive the intimate relations that Physics, Chemistry, and Biology have come to bear to the Science of Medicine. Of the twenty-two contributors to this volume, six are not medical graduates, and this is a very significant indication of the manner in which medicine has broadened its horizon and is seeking the help of the allied sciences.

The introductory remarks by Dr. Osler which take the place of the usual preface are upon the Evolution of Internal Medicine. It includes a historical review which is scholarly and interesting, but the most suggestive part of the introduction is his advice to the medical profession for the future. He urges the need of organizing our resources to get the most out of them for teaching and research, the need of better preliminary training at the bedside and in the laboratory, the fact that the hope of the profession is in the general practitioner who finds it possible to keep abreast of scientific development and to employ the newer methods in his daily practice.

The first section consists of an article by Adami upon inheritance and disease. The recent advances in our knowledge of heredity make some consideration of the subject not only desirable but necessary for a satisfactory understanding of predisposition and immunity.

Part II includes Diseases Caused by Physical Agents, by Alfred Gordon. The chapters are upon light, *x*-rays, electricity, air, heat, and cold. Dr. Gordon has rather a

hard task, because his subject, although important, lies in no definite province of medicine. We question the fitness of a neurologist to pass upon such subjects as the metabolic changes produced by the *x*-rays. This is probably the reason why he omits all reference to the serious disturbance of metabolism in certain cases under the influence of the *x*-rays as described particularly by Edsall. Again, it is the generally accepted opinion that sunstroke is a toxemia, and its treatment is above everything eliminative. Yet this is hardly touched upon by the writer.

Part III consists of four chapters by Edsall upon Diseases Caused by Chemical Agents. Their titles are Chronic Lead Poisoning, Chronic Arsenic Poisoning, Poisoning by Other Metals, Carbon Monoxide, Illuminating Gas, Carbon Bisulphide and other toxic agents. To any one who knows Dr. Edsall's power of thorough and scientific work in any task that he may undertake, the excellence of these articles is not surprising.

Diseases caused by Organic Agents occupy Part IV. Chapters IX and X, upon Alcohol, Opium, and Cocaine, are both by Alexander Lambert. That upon Alcohol is especially complete.

In Chapter XI Novy writes upon Food Poisons, and Chapter XII is by Noguchi upon Snake Venom.

Part V contains two chapters by Wright upon actinomycosis and vegetable parasites other than bacteria.

Then follows three very complete and interesting articles upon protozoa and the insect transmission of disease. Calkins writes of protozoa, Howard of mosquitoes, and Craig of malarial fever. Three more papers by Stevens upon blackwater fever, Bruce upon trypanosomiasis, and Strong upon amebic dysentery, make up Section VI.

Naturally, Stiles has been chosen to write Section VII upon animal parasites, which is entirely satisfactory.

The volume contains no more important sections than those upon the general consideration of nutrition by Chittenden and Mendel, and autointoxication by Alonzo Taylor. Some knowledge of normal metabolism is absolutely essential for a proper understanding of nutrition and dietetics, and surely there is no more important branch of therapeutics or one of greater interest to the practitioner. No better expression of the subject could be asked for. It is concise and complete, and is written with the authority which comes from a mastery of the subject. It is the best article for its length upon nutrition that we know of in the language.

Besides considering in general the mechanism of metabolism it contains an excellent and practical section upon dietetics. The well-known views of Chittenden which advocate the habitual use of the proteid minimum in our diet are considered at length, and a review is given of the work of the writers upon this subject. That this important question is regarded from only one standpoint and is not discussed pro and con is the one part of the article open to criticism. We believe that the writers do not mean to deny that there are two sides to the problem.

Alonzo Taylor considers the Autointoxications in Chapter XIII, and Autointoxication associated with Protein, Purin, Carbohydrate, and Fat Metabolism in Chapter XIV. This is a consideration of pathological metabolism, and is an exceedingly comprehensive and valuable essay. Such a consideration of the subject has been greatly needed, for it deals with several subjects around which are grouped more false hypotheses than can be found in any other branch of medicine. We refer to chronic intestinal autointoxication, the so-called uric acid diathesis, gout, and uremia. The much too popular misconception of these conditions needs ruthless pruning, and no better man could have been found to do this than Professor Taylor. However, while we applaud his efforts to clear away the cloud of medical superstition which envelops these diseases, we feel that perhaps he goes too far in completely ignoring the fact that there are some morbid states that can best be explained upon the assumption of chronic autointoxication by gastrointestinal poisons, although we cannot demonstrate the existence of these poisons experimentally. Indeed, we think that Professor Taylor him-

self believes that such toxemias exist, and we fancy that it is only an excess of zeal in demolishing false gods that makes him forget to state the problems in autointoxication that confront us. Let him not only lead us out of error, but point out the road to truth as well.

The article upon diabetes mellitus and gout are by Futcher. They are among the best papers in this volume, although they deal with very complex diseases in which the pathology is not yet certainly understood. We note the admirable summary of the pathogenesis of diabetes upon page 786 as follows: "In health the pancreas and muscles (and possibly other tissue cells) produce substances which by their interaction on each other yield a glycolytic body—call it a glycolytic ferment if we will—which is necessary for the proper combustion of the glucose in the body." Of course, in diabetes this ferment is not produced.

Under gout it is interesting to remark that gout in Baltimore is only one-third less frequent than in London.

Articles upon obesity by Anders, rickets by Still, and scurvy by Robert Hutchison complete the last section.

As a rule the articles of the first volume are of very even excellence, and it can be considered a distinct success. If the succeeding instalments are of the same high standard, then the whole book will be worthy to occupy the important position in medical literature demanded for it by the appearance of the name of the chief editor in its title. J. D. S.

A Treatise on the Principles and Practice of Medicine. By Arthur R. Edwards, A.M., M.D. Philadelphia and New York: Lea Brothers & Co., 1907.

It is but natural that a teacher should wish to publish a text-book which shall serve his student as an expression of his views. This has evidently been Dr. Edwards's purpose in presenting the volume under discussion, and considered from the standpoint of a text-book it should prove very satisfactory. The book is very well arranged for the student. Its statements are clear and concise, and there are frequent tables of differential diagnosis. Indeed, in this regard it resembles a compend rather than a treatise upon medicine. These points in its arrangement, which recommend it as a book for undergraduates, rather detract from its value as a reference book of diagnosis for the practitioner, who consults an authority for information about exceptional and obscure symptoms and not for well-known facts. Where a medical student can use a differential table of symptoms to great advantage in mastering fundamental facts of diagnosis, this method of presenting the subject to the practitioner is too dogmatic and inflexible.

The arrangement of the subject-matter is that usually followed in such a work. The classification of diseases is scientific and in accord with the most advanced etiology. As Dr. Edwards says in the preface, much attention has been given to treatment. He gives not only the principles upon which the therapeutics of each disease is based, but the methods of treatment are described in some detail and numerous prescriptions are included. In this respect the work should prove useful and popular with the practitioner.

The sections upon the diseases of circulation, respiration, and kidneys are well treated and are the best in the book. That section upon the gastrointestinal tract and the liver and pancreas is on the whole satisfactory, though not so uniformly good as the chapters just mentioned. The book is quite profusely illustrated with engravings and plates, some of which are in colors. We can cordially recommend Dr. Edwards's book as one which will be of great help to the undergraduate student, and which will offer many suggestions to the practitioner, especially in treatment.

J. D. S.

Hypnotism: Its History, Practice and Theory. By J. Milne Bramwell, M.B., C.M. Second Edition. Alexander Moring, London, 1906.

Mr. Bramwell presents this subject in a very interesting manner in this volume, which is a complete treatise upon hypnotic phenomena, and can be recommended as a reference book upon this subject. The student will find in its pages correct data con-

cerning hypnotism arranged in chronological order. The methods for inducing sleep are well described, but the author's own method, on which he lays some emphasis, does not, in our judgment, differ materially from that of many others. The question naturally arises as to whether hypnotism ever amounts to more than ordinary suggestion in an awakened state. The author states that his field of work has been confined to hysteria, neurasthenia, and other functional diseases, and every worker in neurology knows that equally good results are invariably obtained by simple methods of emphatic and impressive talk to the patient. The statement of the author that he has successfully treated cases of insanity by hypnosis is, we think, open to doubt, and still more so the statement that epilepsy was considerably relieved, if not cured, by hypnotism. As to the wisdom of subjecting neurotic patients to hypnosis there is considerable doubt, since by this means we are prone to make them doubly unfortunate, adding evil to a pre-existing evil. As we have already said, this book is of value in providing historical information as to the origin and practice of hypnotism, but the method itself is one which cannot be recommended to physicians in general, and therefore the book must have a very limited field of influence.

A. G.

THE STANDARD FAMILY PHYSICIAN. By Professor Carl Reissig, M.D., and Smith Ely Jelliffe, A.M., M.D., Ph.D. Volumes I and II. The Funk and Wagnalls Company, New York, 1907. Price $15.00 in buckram; $20.00 in three-quarter morocco.

This work of two volumes, of over 500 pages each, is, in the words of its title-page, "a practical international encyclopedia of medicine and hygiene, especially prepared for the household," not only by the Editors, whose names have already been mentioned, but by a considerable number of other contributors in this country and abroad, thirty-two of them being Europeans and ten of them Americans, of whom perhaps the best known are Dr. Butler, of Brooklyn, and the late Dr. Fowler, of the same city. The volume opens with some preliminary information in regard to the family physician, and the structure and functions of the healthy human body, the anatomy of which is quite accurately described, including the organs of special sense and the organs of generation. After this there are some general remarks upon disease, then upon the diagnosis and treatment of disease, and then the various diseases of the different organs are discussed, with the means which should be exercised for their relief. The various poisonings, skin diseases, and the surgery connected with deformities, accidents, inflammations, etc., are included. Both volumes are copiously illustrated.

Of the statements which are made in this book, so far as their scientific accuracy is concerned, we find nothing to criticize. The collaborators are, of course, attempting to perform a task which is exceedingly difficult because, on the one hand, they naturally desire to be accurate, and on the other hand they experience the difficulty which always arises when medical men attempt to make persons who are not educated in regard to medical facts clearly understand medical problems. Our own view is that while books of this character in a concise form are found useful in the household where no physician can be obtained, the exhaustive considerations of the causes, diagnosis, and treatment of disease, when placed in the hands of the laity, often produce results which are undesirable. As illustrating what we mean we think that it is quite unnecessary to present a picture of a woman suffering from far-advanced elephantiasis of the lower extremities, or to show three girls with grinning faces who are subjects of maniacal delirium. So, too, we think that the very well-executed colored plate which shows the forms of calculus and an appendix ulcerated by a fecal calculus will probably serve to alarm a certain number of persons who have no means of determining the relative importance of certain subjects. The picture of a girl taking a shower-bath in a bathing suit seems hardly necessary, in view of the fact that there is a very good colored manikin illustrating human anatomy inserted between the pages of the volume.

On the other hand, there are a very large number of illustrations which are exceedingly useful and appropriate for a book of this character, such, for example, as the beautiful colored plate showing the various forms of mushrooms, edible and poisonous, or that which differentiates between poisonous and non-poisonous herbs which are frequently met with in gardens or elsewhere. Then, too, there are a very large number of illustrations which are valuable in that they instruct mothers and nurses to care for the sick, as in lifting persons who are ill or injured, and in caring for them in the way which is so essential if the physician is to obtain good results from his remedies. For such departments as these we have nothing but the warmest terms of praise. On the other hand, the therapeutic dose-table or index which closes the second volume seems to us capable of doing much harm. Even with medical men definite and dogmatic abbreviated statements as to the use of drugs in the treatment of disease are sometimes misunderstood. There are few physicians who would like to put a book in the hands of their patients in which conium is said to be useful for melancholia, heart troubles, liver engorgement, mania, scrofulous ophthalmia, etc., with the further statement that the dose of the fluid extract is 2 to 6 drops and that of the extract ½ to 1 grain. Such a form of advice employed by the laity without competent medical advice, in this and a large number of other instances which might be cited, we think is unwise. So, too, the large plate which illustrates the localization of areas of tenderness in the body in connection with deep-seated or organic disease is quite qualified to produce a host of symptoms in a neurasthenic patient, and the line reading from a painful spot in the nape of the neck to the words "cerebrospinal meningitis, cerebral tumors, constipation, neuralgia, caries of teeth, masturbation, and ear diseases" would make an imaginative man, or woman, believe that both "feet were in the grave."

As a matter of fact, these volumes are likely to be very much more useful to physicians than to the laity, and many of our readers can gain much excellent information from them. In those instances in which a physician has an exceedingly sensible patient who is going to be so situated as to be unable to call in a competent practitioner, these volumes can be heartily recommended as being correct in the advice which they give. The work of the American editor and his associates has been performed in a very praiseworthy manner, and by his skilful touch the book has been materially improved and made more useful for English-speaking readers.

FOODS AND THEIR ADULTERATION. By Henry W. Wiley, M.D., Ph.D. P. Blakiston's Son & Company, Philadelphia, 1907.

This volume, which covers about 600 pages, is of more than ordinary interest at this time because it deals with a subject which has been brought before the eye of the physician and the laity with extraordinary clearness by reason of the passage by Congress of the so-called Pure Food and Drugs Act. The fact that Dr. Wiley has been the court of last resort in determining the character of adulterations and the standards of purity, makes anything that he may say on the subject of more than ordinary interest. After looking over its pages we can only say that this is one of the most interesting books which has been presented to us for a long time. After some introductory pages dealing with rations, the definition and composition and classification of foods, Part I deals with Meat and Meat Products; Part II with Poultry, Eggs, and Game Birds; Part III with Fish Foods; Part IV with Milk and Milk Products and Oleomargarine; and then follow chapters upon the various Cereal Foods, Vegetables, Fungi, Sugars and Syrups, Invalid and Infant Foods. An appendix closes the volume and contains food standards, the rules and regulations for the enforcement of the Act which we have spoken of, and Food Decisions under the Pure Food and Drugs Act. The volume is copiously illustrated, fills a distinct niche of its own, and will doubtless have a very large sale both for this reason and because it is ably and well prepared.

ENCYCLOPEDIA AND DICTIONARY OF MEDICINE AND SURGERY. Volume IV. William Green & Sons. Edinburgh and London, 1907.

We have already called attention to the appearance of this valuable encyclopedia published by William Green & Sons, of Edinburgh and London. The present volume extends from "Gum-Resins" to "Intussusception." The Editor is Dr. J. W. Ballantyne, who is well known to many of our readers. Among the contributors to the present volume we find such well-known men as Alexander Morison, T. L. Kelynack, Graham Steele, Moynihan, D'Arcy Power, Milne Bramwell, Colcott Fox, and Sir W. J. Moore. Perhaps the most interesting articles in the volume to the general practitioner are those upon the Heart, Hernia, Hip-joint, and Immunity (this article being written by Prof. Hans Buchner, who has done so much original work along these lines). We are sorry that more encouragement is not given in the article on Hydropathy to the employment of water in typhoid fever and other infectious diseases. Nothing is said in regard to the necessity of applying friction to aid in the dissipation of the heat at the same time that the cold bath is employed. The statement is made that the plunge is to be taken when the temperature is 103°, although most practitioners resort to it when the temperature is at 102°; and finally the erroneous statement is made that the patient should be immersed in a bath at 90°, which should be "cooled down to even 70° or 60°." It is evident from this article that this very valuable method of treating typhoid fever has as yet to win its way to the English practitioner. One of the most extraordinary things in the history of modern medicine is the slowness with which hospital physicians in England have resorted to this life-saving measure.

A MANUAL OF PERSONAL HYGIENE. By American Authors. Edited by Walter M. Pyle, A.M., M.D. Third Edition, Revised and Enlarged. W. B. Saunders Company, Philadelphia and London, 1907. Price $1.50.

Although this is a small volume of less than 500 pages, there are eight contributors to its construction in addition to the editor. The object is to present the best means of developing and maintaining physical and mental vigor, and therefore there are chapters upon the anatomy and physiology of the various parts of the body and statements concerning methods of so-called proper living. Technical phraseology is largely avoided. In the third edition chapters have been added upon home gymnastics, domestic hygiene, and an appendix contains a description of the simpler methods of hydrotherapy, thermotherapy, and mechanotherapy, as well as first aid in medical and surgical accidents and emergencies. The volume closes with a glossary of medical terms. Any book of this nature deals with matters which it is easy for the laity to misunderstand, and we think that certain parts of the volume have not been wisely edited. Certainly, the drip-sheet, the hot-air bath, acid steam bath, and the hot pack are measures which should not be employed by non-medical persons without competent advice. On the other hand, the advice which is given as to travel, exercise, dress, and the care of the skin is most excellent, and we know of no book which can be placed in the hands of the laity which will give them more satisfactory knowledge concerning their own health than the one under notice at present.

CHEMICAL PATHOLOGY. By H. Gideon Wells, Ph.D., M.D. W. B. Saunders Company, Philadelphia and London, 1907. Price $3.25.

This book is a discussion of general pathology from the standpoint of the chemical processes involved, and is written by the Assistant Professor of Pathology in the University of Chicago, who dedicates his work to Dr. Ludvig Hektoen of that city. As the author points out, the subject of biological chemistry has attracted a great deal of attention during the last two decades, at first in physiological studies and more recently in pathological states. Of course, gout and diabetes are the two conditions in which pathological chemistry has done the most work, yet there are a vast number of researches concerning other forms of perverted metabolism which require careful consideration and summarizing. The present volume starts out with

the assumption that the reader has at least some knowledge of organic and physiological chemistry. In order that those who have not kept up with this subject may be primed for consideration of the main part of the book an introductory chapter is introduced which epitomizes the more modern views concerning the chemistry of the proteid molecule, the composition of the animal cell, and the principles of physiological chemistry in so far as they apply to biological problems. Altogether there are 22 chapters in the book. Copious references to sources for collateral reading are given, and few statements are made without giving the references upon which they are based. Dr. Wells's book has already been received in a complimentary way by those who are best able to judge of its value, and as most physicians are, or should be, interested in these subjects, it should have a considerable degree of popularity.

THE PRINCIPLES AND PRACTICE OF DERMATOLOGY. Designed for Students and Practitioners. By William Allen Pusey, A.M., M.D. D. Appleton & Company, New York, 1907.

Dr. Pusey's book is to be classed among the larger and more exhaustive works devoted to this subject. It is very copiously illustrated, containing one colored plate and 367 text illustrations, all of which seem to us far better than those which are commonly found in text-books upon dermatology. In a number of instances the collection of pictures which has been made by Dr. Schamberg, of Philadelphia, is utilized in illustrating the text, and as far as it is possible for black and white pictures to show skin lesions, these undoubtedly are excellent in their quality. In connection with the treatment of epithelioma of the skin we note with interest that the author is evidently a strong believer in the employment of the *x*-rays and caustics in distinction from the knife. Pusey asserts that his experience has taught him that recurrence is far greater after excision than after treatment by the *x*-rays or caustics. In those instances in which the mucous membrane or glands are involved, he believes that an operation followed by *x*-rays is the best treatment. Small epithelioma can be destroyed by electrolysis. In most of the instances in which caustics do not seem to act well the difficulty lies in the crude method of employing them and the failure to recognize the exact conditions in which they are of value. One of the things in this volume that strikes us as being particularly interesting to the general practitioner is the large amount of definite and direct information which is given by the writer concerning the plans of treatment which he advocates.

THE DIAGNOSTICS OF THE DISEASES OF CHILDREN. By Le Grand Kerr, M.D. W. B. Saunders Company, Philadelphia, 1907. Price, $5.00.

Under this somewhat awkward title the writer has prepared a very useful text-book upon the diagnosis of diseases as they are met with in children. The book covers nearly 550 pages, but could easily be condensed into a much smaller volume by using less heavy paper, less margin, and less space between the lines. On the other hand, this generosity as to space on the part of the publisher renders the book easily read and attractive to the eye. A considerable number of black-and-white illustrations are scattered through the volume. Many of these illustrations are modeled after those found in Butler's Diagnosis. The book does not claim, so far as we have been able to discover, any originality, and most of the facts which are stated in it will be found in the larger text-books of diseases for children. The statements made in it, however, are correct and concise, and those who desire a book devoted solely to diagnosis in diseases of children will find what they need in Dr. Kerr's volume.

THE CARE OF THE BABY. By J. P. Crozer Griffith, M.D. Fourth Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1907. Price $1.50.

With this manual for mothers and nurses many of our readers are probably familiar. The book is designed, as its title indicates, for the use of mothers and nurses, and not for physicians, but, on the other hand, there is scarcely any practitioner, and certainly no young one, who will not gain much valuable information from a perusal of its pages, both as to the clothing, feeding, and nursing of children under five years of age. As in

other books upon this subject, the author at times in giving information concerning the various infectious diseases treads on ground which may not be easily trod by members of the laity, but as a rule no information is given which will cause unnecessary alarm. That such a book often gives comfort and valuable information to anxious mothers and nurses cannot be denied, and to such persons this one can be cordially recommended.

THE AMERICAN POCKET MEDICAL DICTIONARY. Edited by W. A. N. Dorland, A.M., M.D. Fifth Edition, Revised and Enlarged. W. B. Saunders Company, Philadelphia, 1907. Price $1.00.

It is but a few months since that we noticed in terms of praise the "American Illustrated Medical Dictionary" by the same author, and this pocket dictionary is practically a condensation of that larger volume. It is a duodecimo of 578 pages, and in addition to containing brief definitions of most medical terms, and the terms used in kindred sciences, it also has a considerable number of tables with the various weights and measures and doses. In other words, it is supposed to be emphatically a dictionary for students rather than practitioners, who usually require more extensive definitions when referring to a work of reference.

THE ESSENTIALS OF HISTOLOGY, DESCRIPTIVE AND PRACTICAL. By Edward A. Schäfer, F.R.S. Seventh Edition, Revised and Enlarged. Lea Brothers & Company, Philadelphia, 1907. Price $3.50.

This standard book upon Histology, which is to microscopic anatomy what Gray's is to macroscopic anatomy, has appeared in a new edition which maintains all the advantages of the earlier edition, and is pretty thoroughly up to date. It is very copiously illustrated in black and white and colors, and is printed on excellent paper, which is, however, so thin that the book can be readily carried about. To those who are interested in the study of histology it is only necessary to announce the appearance of a new edition.

A MANUAL OF OBSTETRICS. By A. F. A. King, A.M., M.D., LL.D. Tenth Edition, Revised and Enlarged. Lea Brothers & Co., Philadelphia and New York, 1907.

Dr. King's little work upon Obstetrics has so long been one of the standards with medical students and medical practitioners that a review of its contents is unnecessary. The author has, of course, taken the opportunity to bring the book up to date, to freely illustrate it where illustrations are of practical value, and the book will doubtless remain as popular as it has been for many years.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.A., M.D.

A case of considerable interest was reported at the Pathological Society of London during this month by Professor Grünbaum, of Leeds University. The patient was a chimpanzee, whose portrait was shown, the patient himself having departed this life. Over the right eyebrow an abrasion had been made, and into this had been rubbed an excised hard chancre from a man. After an interval of weeks a rash had followed, which was more or less generalized; the animal recovered from this acute stage of the syphilitic infection, and some months later began to have fits, apparently Jacksonian in character. After its death, several months after the inoculation with syphilis, lesions were found in the brain which were thought to be syphilitic in character, and the spirochæta pallida was demonstrated in some parts of the body.

Many of the medical societies of London are nearing the day of dissolution, and it must be admitted that their mortal remains are remarkably small, for they have dwindled into a state of feebleness which makes it fortunate that they are very soon to take

a fresh lease of life as a corporate body, the Royal Society of Medicine; but whilst some of these are "on their last legs," and the new and amalgamated society is yet unborn, it is surprising to see an entirely new and independent medical society spring into being and apparently start life with a vigor far surpassing anything familiar to our London societies. This new organization goes by the cumbrous title of "The Association of Physicians of Great Britain and Ireland," and it has just held its first meeting, which naturally took place in London. Rarely does so enthusiastic or crowded an audience gather to listen to medical papers, or rather medical talks, for one of the features of this new association is the tabooing of written or read "papers"—the communications are intended to be unwritten as far as possible; that ubiquitous wet-blanket, the reporter, is excluded. The meetings—for each annual meeting is to occupy two whole and consecutive days and consist of morning and afternoon sessions—were crowded with hospital physicians from London and from all the provincial teaching hospitals. The first business was to elect a president, and for this post the right person was obviously the leader of the medical profession in this country, the president of the Royal College of Physicians, Sir Douglas Powell. Then communications were listened to, and many of very great interest were made; in the afternoon patients were shown; and on the evening of the first day the association held its first dinner at the Trocadero Restaurant. Sir Douglas Powell took the chair, and was supported by Professor Clifford Allbutt, Professor Osler, the president of the Royal College of Physicians of Ireland, and many other leading members of the profession. Altogether the first meeting of this new association has been a brilliant success, and it is to be hoped that it may continue to flourish, and perhaps there is the more chance for it to do so, as it is to meet only once a year for two days, and each time at a different town, so that custom may not "stale its infinite variety." Next year it is to be in Edinburgh.

An interesting departure was made by the children's hospitals of London this month, by holding a conference of representatives from all these institutions to consider the problem of the milk supply to such hospitals. There are at least eight hospitals for children in London, exclusive of some special hospitals, such as the Alexander Hospital for Hip Disease, and yet hitherto there has been no attempt to coöperate in matters of hospital organization. It was felt that in a matter of such importance as the milk supply some attempt at united effort might be made, and two representatives from each children's hospital were called together at the Hospital for Sick Children, Great Ormond Street, to draw up some recommendations for general use. The main points agreed upon were that the hospital committees shall insist upon a supply of pure milk from healthy cows which are to be tested at least quarterly by a veterinary surgeon; that the milk shall contain not less than 3 to 5 per cent of fat; that the hospitals shall have the right to inspect the farms which supply the milk; that the milk shall be strained and refrigerated, canned and sealed at the farm, and delivered with the seal intact at the hospital; that the milk shall not be pasteurized without the special sanction of the hospital committee; and that the milk shall be subjected to chemical and bacteriological tests once a week at the hospital. It remains to be seen whether these are mere counsels of perfection, but anyway the promulgation of these recommendations is a hopeful indication that the children's hospitals are waking up to the fact of their responsibility in the matter of forcing upon the milk trade more wholesome conditions of supply.

Sir Samuel Wilkes once said that on his retirement from the active to the consulting staff of his hospital he was called a "consulting physician" because no one ever consulted him, apparently on the same principle which made Varro say that *"lucus"* was derived *"a non lucendo."* Each year sees some of our best-known and most eminent physicians retiring from the arena of hospital work; in some of our London hos-

pitals this takes place when a certain age limit is reached, in others after a certain period of service. In the past month two well-known physicians have retired from the active staff of their respective hospitals —Dr. Frederic Taylor, whose text-book of medicine has for many years made his name familiar to all medical students, and Dr. D. B. Lees, of St. Mary's Hospital, who had advocated so powerfully the value of the ice-bag in medical treatment, for instance in pneumonia, pericarditis, and even in nephritis. It might be well if the exalted rank of consulting physician carried with it some opportunities for bestowing on the hospitals the often invaluable help of long years of large experience.

Probably few men would have the pluck or the patience to face a gathering of such persons as met at the Portman Rooms in Baker Street last week, to uphold the thesis that vivisection is unnecessary to the advancement of science and medicine, nor is its practice in accordance with the claims of morality and the further development of altruism. But a champion of truth and common sense was found in Professor Halliburton, the world-renowned physiologist, who accepted the challenge to come and debate the point with some of the most rabid of the antivivisectionists. The hall was packed with supporters of both sides, and so intense was the interest felt that almost involuntary exclamations were heard from time to time from all parts of the hall as the combatants waged their wordy warfare. I need not report here the details of the debate; they have been published in full elsewhere. Suffice it to say that Professor Halliburton delivered such a masterly vindication of vivisection that no one who was not familiar with the impenetrable ignorance and bias of the antivivisector could have supposed it possible that at the end of the meeting there would be a majority against vivisection, but so it was.

A pleasing hospitality is that of the club known as "The Maccabæans," a body of Jews in London, who each year entertain representative members of some department of activity, and this year honored the medical profession. The presidents of both the Royal Colleges, of Surgeons and Physicians, were there, also ex-presidents and the professors of surgery and medicine, and "a great many more of lesser degree. In sooth a goodly company." Mr. Henry Morris, the president of the Royal College of Surgeons, made a humorous speech. Many complimentary things, he said, had been written in Hebrew and Greek about physicians that were really intended for surgeons. Referring to the conflicting manifestoes which have been issued recently by members of the medical profession on the use of alcohol, he said that an ancient code, dating back to 2150 B. C., recognized wine-houses as licensed institutions; the wine, however, it must be mentioned, was not made from the juice of the grape but from prunes!

A few days ago there passed away one whose name was well known in this country as a distinguished physician, Sir Joseph Fayrer. He served as a surgeon through the Indian Mutiny, and became a great authority on matters of hygiene and medicine connected with India. He was honorary physician to Queen Victoria and subsequently to our present King, and passed to his rest, laden with honors, at the age of eighty-three years.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., AUGUST 15, 1907. | Third Series, Vol. XXIII, No. 8.

ORIGINAL COMMUNICATIONS.

ETIOLOGY OF IRITIS.

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Not many years since the recognized causes of iritis were few, and the clinician considered the cause in a case as obscure if inquiry failed to disclose a history of syphilis or rheumatism. To-day we find the etiological list includes, besides syphilis and rheumatism, gout, tuberculosis, gonorrhea, diabetes, nephritis, malaria, some infectious fevers, anemia, autointoxication, sinusitis, and, in distinct classes, trauma and sympathetic inflammation, adolescence and senility.

In many of the above conditions the iris is not involved primarily but because it is anatomically a part of a structure other portions of which are far more susceptible to systemic disturbances, as a result of which it becomes secondarily involved.

Notwithstanding that improved methods of research have so broadened our etiological view, the fact remains that the cause in at least 85 per cent of all cases of iritis may properly be assigned to syphilis and rheumatism.

Syphilis is the cause in about 70 per cent, and is an excitant in both the secondary and tertiary stages. The iritis may occur as a *congenital,* a *hereditary,* or as an *acquired* condition.

Congenital iritis is of very rare occurrence. The inflammation has, however, been observed a few hours after birth, so that its existence as a prenatal condition cannot be doubted, and the later appearances of syphilitic symptoms have in every case given the clue to its origin.

Hereditary iritis is likewise very uncommon, but has been seen at the early age of six weeks. The possibility of hereditary iritis being also due to the bacillus tuberculosis must be borne in mind.

As a lesion of acquired syphilis, iritis appears almost always as a secondary manifestation between the second and eighth months of the disease.

In the absence of a history of syphilitic infection or of evidence of the disease it is impossible to be at all certain as to the cause of the iritis, as distinctive signs do not appear in all cases. Should the disease occur in an adult in a bilateral form, or become so, and be of a plastic type, accompanied by severe nocturnal pain, it would suggest a syphilitic origin; should condylomata form in the iris, they would be almost certainly of such origin; should spirochætæ pallida be discovered it would be conclusive. In the tertiary stage gummata may appear.

Rheumatic iritis forms the second large group. It occurs generally as a complication of what is commonly called chronic rheumatism. What was said of the lack of symptoms diagnostic as to cause in the case of syphilitic iritis is equally true of

this type. A tendency toward recurrence is believed to be suggestive.

Gout as a cause is certainly very rare in this country. An insidious form of iritis in a gouty subject would indicate it to be a part of this protean disease.

Tuberculous iritis is of necessity a secondary condition, as primary infection could result only from the almost inconceivable occurrence of traumatic conveyance. The tuberculous nature would be determined by the nodular growths in the iris, reaction to tuberculin, and by the success of animal inoculation. Nodules have been observed on the iris in leprosy.

Gonorrheal iritis occurs usually in association with joint involvement. It probably does not appear as a complication in one-fourth of one per cent of cases of clap. The origin of the iritic inflammation would be determined by the general symptoms.

The frequency with which iritis occurs as a complication of diabetes varies. It has been seen by one observer in 5 per cent and by another in 20 per cent of cases. It appears usually as a mild purulent type. A serous type has also been observed. The author has, in one case, noted severe iritis of a recurring hemorrhagic form after iridectomy in diabetes. A few instances of iritis as a complication of nephritis have been recorded.

Iritis as a complication of malaria is seen but rarely in this part of the country, but is probably of more frequent occurrence where paludal fever abounds. Iritis occurring in the course of infectious fevers, herpes zoster, and cerebrospinal inflammations is usually of a purulent but may be of a serous type, and the iris is involved as a part of the uveal tract.

The strides that have been made in physiological chemistry have disclosed in many conditions the heretofore obscure cause. As was to be expected, the workers in the science of ophthalmology were early in discovering that these conditions of disturbed metabolism were responsible for many cases of uveal disease for which no better causal explanation could be previously given than idiopathy. So far as concerns iritic inflammations, a form in which the attacks are recurring or relapsing, occurring usually in healthy individuals, has been shown by Elschnig to be due to autointoxication.

Disease of the accessory sinuses has been held responsible for so many ocular affections that the claims of enthusiasts have made the judicious grieve, so that it seems strange that there should be a diversity of opinion even among partisans as to the implication of those very structures which from the anatomical relations would appear to be peculiarly susceptible. Some very careful observers who have particularly studied this subject have failed to detect a single undoubted instance of uveal disease of this origin, while others have frequently noted it.

Traumatic iritis: In a large majority of cases traumatic iritis occurs as the result of extensive injuries or operative wounds involving other structures besides, so that it needs but to be mentioned. More definitely of this type are those cases of congested or inflamed irises from contusions of the globe. In this category (traumatic iritis) might be mentioned ophthalmia nodosa, in which the iris is involved.

Sympathetic iritis: This should be viewed as the anterior expression of a uveitis, and for that reason will not be gone into more fully.

A peculiar, stubborn, insidious inflammation of the pigment layer of the iris occurring in female adolescence has been described by Grandclémont under the term "Uveite Irienne." The writer has seen an instanee of this affection. There has been described as senile iritis an insidious form of inflammation occurring in the aged characterized by unequal involvement of the two eyes and a mucopurulent conjunctivitis; the latter disappears, and is followed by profuse lacrimation.

IRITIS IN GENERAL DISEASE.[1]

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No other field in the body presents facilities for study equal to that of the eye, for in this organ we have the opportunity to examine sensitive and specialized tissues in all the palpitation of their functional activity. It need not be wondered at therefore that systemic affections are likely to produce derangements in the structure and motility of the iris, and it is important to observe that such derangements have been noted as having been manifested early in the course of general disease. I have noticed transitory hyperemia and immobility of the iris in the early weeks of typhoid fever and in epidemic cerebrospinal meningitis; and again, in the stage preceding the chill in malaria. Pronounced inflammation of the iris and ciliary body may occur, however, as an accompaniment of profound dyscrasias, and so prominent are the symptoms that we apply to them the name of the general disease.

As might be expected, those diseases dependent upon the evolution of micro-organisms within the body are likely to produce disorders in such highly vascular structures as the iris and ciliary body; consequently we may assume that all cases of iritis and iridocyclitis, not dependent upon traumatisms, have as their causative basis a general toxemia.

It is not my purpose to dwell long on the main clinical characteristics of iritis, such as we see at the Wills and other special hospitals, but to give a brief outline of their occurrence in the course of general disease.

Syphilis.—Iritis is seen in hereditary and acquired syphilis. In the former it is seen during the first two years of life, at about six years of age, and occasionally it manifests itself for the first time in late adolescence. In these latter groups it may occur alone or along with interstitial keratitis. One or both eyes may be attacked. Attacks of iritis in infants and children if not traumatic are almost invariably due to inherited syphilis. It is rare to see simple iritis in children, but it is commonly found secondary to keratitis. Jonathan Hutchinson observed it more frequently in girls than in boys. The few cases I have seen have been in boys.

I believe the infection may lie dormant until late in adolescence, and then break out when some unusual psychic or physical strain is laid on the individual. In the form seen in older subjects the ciliary body is implicated, so that it is really an iridocyclitis that we have to deal with, and the cornea, too, may be involved. Both eyes are usually affected, yet not simultaneously. The diagnosis is sometimes difficult, for the family history may be obscured, and the patient may have perfect teeth and be free from scars, though occasionally there may be deafness and there may be signs of a long existent but low-grade disease in the choroid and retina. We may suppose that there have been earlier attacks of iritis because the iritic changes are usually more extensive than after a primary attack. I have noticed this variety more frequently in girls—may it not be that they have had a simple iritis in infancy which has been overlooked?

In acquired syphilis, iritis, or iridocyclitis, may be met with at two periods, either within a year affer the infection, or at a much later time. It generally develops as a plastic inflammation, or as one which is accompanied by the formation of gummata. Usually it occurs at the time of definite general manifestations, and until these signs accompany it, it is difficult to decide upon a correct diagnosis as

[1]Read before the Wills Hospital Ophthalmic Society, March 11, 1907. A "Symposium on Iritis."

to the causation. At the outset the inflammation is limited to one eye. At times one meets with iritis in the tertiary stage of syphilis ten or fifteen years after the original infection. Here are found extensive disseminations of the infection, and usually both eyes are affected and all the structures of them may be invaded.

Rheumatism, Gonorrhea, Gout, and Lithemia.—Iritis may develop in the rheumatic, nevertheless it is rare in rheumatism. I could find no account of its occurrence in rheumatic fever prior to 1903, when Forster reported a case of iritis in acute rheumatism in the *British Medical Journal* for March of that year. And, at the meeting of the American Ophthalmological Society in 1905, Hiram Woods detailed three cases of recurrent iritis in which acute inflammatory rheumatism was the cause of the original attack, and he attributed the iritis in one case to hereditary tendencies.

It is rare to find it in infants or young children; the subjects are usually in middle life or in old age. The onset may be slow and insidious, or rapid and violent. The victims are seized usually in the winter and spring months, for they are susceptible to damp weather. The symptoms present no specific characteristics of this dyscrasia, except when the joints are involved the eyes may be well, but when the joints are well the eyes may be affected; and the joint symptoms associated with the iritis are usually fixed and not fugacious like those of acute rheumatism.

In time we shall learn that rheumatism is a bacterial disease, and the organism causing it will be definitely isolated. At present several organisms are capable of producing joint affections, and they may lie dormant for a long time. Frequently, when iritis attacks young men who are free from syphilitic taint, but who have had gonorrhea, and who have presented indeterminate rheumatic symptoms, the arthritis is an infectious process capable of permeating the system; and I believe the cause of the iritis is the gonococcic material. The gonococcus may remain inactive just as other organisms do, and when it inflames it may assume protean manifestations. An instance of some moment to me came under my observation recently; it was that of a young man who had had small abscesses, like boils, which when they were incised were found to contain an abundance of gonococci. We find in some cases, therefore, that there is a distinct connection between the general disease and the inflammation of the eyes. Here there are pronounced joint symptoms which have set in several weeks or months after the urethral disease. The iritis usually recurs with each fresh attack of urethritis; there may be exacerbations, however, without there having been a fresh contamination, for we now know how profoundly the system can be invaded by a single injection of the gonococcic material. Perhaps a thorough search of the history of many of our cases of recurrent iritis will yield a positive admission of an early blennorrhea. I do not dare to state that all such cases of iritis are due to gonococcic infection, for, as I have already pointed out, recurrent iritis may be due to rheumatism.

Gout.—It is doubtful whether iritis develops in true gout. I have not seen the gouty iritis, described by the older writers, which my first teachers warned me to look for. I hesitate to classify as gout those irregular cases which present symptoms of the so-called uric-acid diathesis, dependent upon faulty metabolism, to which we apply that vague term "lithemia;" nor those of that other group, also dependent upon disturbed metabolism, through which insufficiently oxidized substances are absorbed into the system from the gastrointestinal tract, and to which we now give the term "intestinal autointoxications." We frequently see iritis in persons whose condition can only be resolved into one or the other of these groups; and the attacks may recur repeatedly until the defective food or tissue metabolism has been eradicated. Accordingly, in my judgment, the term gout should be reserved to be applied to those cases in which the family have had podagra, or in which the

personal history discloses the facts of acute and chronic inflammations in the joints with deposits in the cartilages.

No doubt many cases of "hot eye" of the olden times were really such as we would now class as glaucoma—a corollary upon a previous statement of mine, that essential glaucoma is a part of a systemic disease. Nevertheless, competent observers have declared that iritis does occur in gout; but before accepting this dictum as final we must exclude rheumatism, gonorrhea, and syphilis as other probable causes.

Tuberculosis.—Iritis in tuberculosis is less rare than it was once thought to be. It is found in scrofulous children and in adolescents with enlarged lymph glands, who may or may not have demonstrable tuberculous deposits in their lungs. It is difficult to decide whether it is a primary or secondary disease. It may supervene after an attack of measles in a child of low vitality. Death may ensue from miliary tuberculosis or from meningitis, if not from simple phthisis. It appears as localized or as multiple disseminated nodules, and it may be difficult to decide whether the nodule is tubercular, gummatous, or of hyperplastic formation. The anatomical as well as the antecedent personal and family history must be studied before coming to a conclusion, and the effects of a prompt and vigorous course of mercurials observed.

At the meeting of the British Medical Association in July, 1905, Jessop expressed his doubts whether intraocular tuberculosis is ever primary, and he therefore deprecated the excision of tuberculous eyes unless the pain is very great and the general health much affected. In Dr. Schwenk's service in 1906 I had the opportunity to watch the progress of a case of tuberculous iritis, in which there were multiple nodules in each eye. The young man was sent to White Haven later on, and the last accounts from him showed that he had made a distinct gain in his general health.

Acute Infectious Diseases.—Iritis may occur in the course of the acute infectious and exanthematous diseases. It has been seen in typhoid fever. I noted it in a goodly number of smallpox patients, and also in others suffering from epidemic cerebrospinal meningitis. As a rule it was manifested as the serous variety in these cases. It is difficult to decide whether the iritis seen rarely in influenza has been produced by that infection, or whether it has been only a coincident affection.

Malaria.—I have known sailors who have had malaria while in the east, and others who resided years ago in the malarious districts of this country, to have iritis which has recurred and recurred until after a prolonged antimalarious course had been followed out. The only severe case of true malaria I have attended in my private practice had distinct hyperemia of his irises in the early hours of his attacks.

Meningitis.—All forms of cerebrospinal meningitis may be accompanied by iritis. In mastoid abscess with meningitis supervening, a leucocytic thrombus may become lodged in the ciliary arteries and give rise to a suppurative iridocyclitis, and rapidly destroy the eye. In tuberculous and epidemic meningitis, no doubt the iris is invaded by the microbic products circulating in the blood or other nutrient fluids of the body.

Whooping-cough.—In *Klinische Monatsblätter für Augenheilkunde* for May, 1905, Chronis reported a case of intense iridocyclitis in a child of nine months during an attack of whooping-cough. He believed the infection was due to an embolism of the capillaries in some portion of the eye.

Pyemia.—Iritis occurring in pyemia may be considered as suppurative in type and as having been caused by the lodgment of an infected thrombus in the ciliary arteries.

Infection from the Mouth.—In the *Lancet* of July 22, 1905, Campbell suggested that iritis might be caused by infection from the mouth. His patients had pyoalveolaris. The iritis was cured when the oral cavity became aseptic.

Diabetes.—Diabetes is surely an autointoxication, and the organic changes

noted therein have been caused by the circulation of toxic substances in the blood. Accordingly, so highly vascular an organ as the iris may be severely damaged by this disease. We see the effects of the diabetic process in the severe iritis that frequently follows a careful extraction of cataract in a patient subject to the disease, and in the detachment of the iris during an iridectomy; while in the course of diabetes there may arise a simple to a severely purulent iritis.

Albuminuria.—It is not too much to expect that the iris as well as the retina should manifest disorder in the course of Bright's disease; indeed, it seems strange that more cases of iritis in this disease have not been reported. Dr. Norris, following the example of Leber, used to teach the necessity of examining the urine in obstinate cases of iritis. Since Leber's, occasionally other cases have been reported. Knies reported two, and recently Semple, in the *American Journal of Ophthalmology* for June, 1905, detailed the history of a case of iritis in which there was albumin with casts, and in which no improvement took place until remedies useful in nephritis were employed. Distinctive signs of retinitis may be absent in cases of albuminuria. Alt, in the *American Journal of Ophthalmology,* July, 1905, therefore suggests the value of this form of iritis in the prognosis of renal disease.

The list here given of the diseases in which iritis has been present is not complete but only includes those states most commonly seen. I hope it is sufficient, however, to emphasize the importance of a careful inspection of the eyes in all cases of general disease, in order to defend the patient from incurably defective sight, if not from absolute blindness, on his recovery from the major malady.

SYMPTOMS OF IRITIS.[1]

BY SAMUEL D. RISLEY, M.D.,

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Probably no form of ocular disease presents more pronounced symptoms than inflammation of the iris.

For convenience of study the symptom-complex may be grouped as objective and subjective.

The appearance of the eye as seen by the surgeon and the suffering described by the patient will vary with the stage of the disease and its severity, and in many respects with the type of iritis under study.

For example, there will be in both the objective and subjective signs of iritis a marked contrast between the slow, subacute forms of disease called by writers serous iritis, uveitis, descemetitis, etc., and the inflammatory storms attacking the highly vascular iris and choroid tract as seen in acute rheumatic or syphilitic iritis. The former, usually attacking individuals whose general vitality has been sapped by some dyscrasia, often begins in the posterior segment of the uveal tract, spreads forward until the ciliary region, iris, and membrane of Descemet become involved, and sooner or later causes disturbances of nutrition in the vascular structures of the globe—*i.e.*, the vitreous body, lens, and cornea.

Objectively the surgeon will find a more or less blurred or foggy image of the fundus oculi, due, in the early stage, to infiltration of the choroid and retina, which may readily be overlooked. Later, as the disease advances the fundus is more obscured, or ophthalmoscopic study of its details becomes impossible, the obscuration being caused by a granular débris in the vitreous thrown out from the choroid and

[1]Delivered as part of a symposium on Iritis, at the Wills Eye Hospital, Philadelphia.

ciliary processes, or possibly by degenerative changes in the vitreous body itself; by changes in the posterior capsule of the lens; by exudation from the iris and ciliary body into the aqueous humor; or by deposits on or pathologic changes in the endothelium lining the anterior chamber. This increased exudation and the resulting changes in the character of the fluids in the interior of the globe not infrequently overtax the capacity of the excretory channels of the eye and cause increased tension of the ball, with its attendant symptoms and dangers. The iris loses its normal luster, does not react to light and shade, and may be fastened to the anterior capsule of the lens by one or more delicate synechia which are revealed only after the instillation of a mydriatic. Where the exudate into the aqueous is abundant the eye takes on a lusterless appearance, and gray, round, dot-like deposits are formed on the posterior surface of the cornea (punctate keratitis), sometimes assuming a triangular form with the apex of the triangle at the pole of the cornea, its base spread out at the lower limbus of the angle of the anterior chamber. When the tension of the ball is high the epithelium of the cornea may appear steamy or assume a needle-stuck appearance. There will be some redness of the eye, with a dull, rose-like injection of the anterior ciliary vessels, but so comparatively slight as to form a well-marked contrast to the conditions observed in cases of acute inflammatory iritis.

Subjectively studied this form of iritis is colorless in most of its features when placed beside the glowing picture of the acute inflammatory forms of iritis we are presently to study. There is at first a hardly notable impairment of vision, which may readily be neglected by the patient, but which steadily increases, it may be to only quantitative perception of light, or to complete loss of vision if treatment is neglected. This is especially likely to occur in cases in which the increase of tension is a marked feature or in which the rapid progress of degenerative changes is fostered by a well-marked vice in the general nutrition.

Even after blindness has resulted the degenerative changes progress. The ball becomes soft, begins to shrink, and passes steadily into phthisis bulbi, or it may manifest alternating exacerbations of glaucomatous tension with pain. In either case the ultimate result is atrophy of the ball with recurring attacks of sympathetic irritation, which demands its removal to save the fellow eye.

The clinical picture and history presented by acute plastic iritis is very different both as regards its objective and subjective signs. Much has been written regarding the classification of acute inflammatory iritis, the effort being made to arrange the disease in different cases, either on the basis of etiology—*e.g.*, rheumatic, traumatic, syphilitic; or upon its pathologic manifestations—*e.g.*, plastic, infectious.

Personally I have been unable to say from the objective signs that the case in hand was rheumatic or syphilitic, except in the somewhat rare cases of nodules upon the iris. But even here one might guess that the nodule was a syphilitic gumma or a focus of tubercular infection. In a word, the objective features of the disease present no sufficiently distinctive signs by which we can declare its etiology. At the outset of the disease the only signs visible to the surgeon are those of hyperemia—that is to say, conjunctival and subconjunctival injection.

The iris in the affected eye is a darker shade of color than in its fellow, redder in the brown iris, a yellowish-green in the gray or blue iris; there is sluggish reaction to light and shade. Pressure through the eyelids empties the conjunctival blood-vessels and reveals a pale lilac zone of injection surrounding the corneal limbus like a halo. The pupil dilates sluggishly under a mydriatic, and not so widely as in the healthy eye. The ophthalmoscope shows that the hyperemia has extended throughout the uveal tract, and the beginning infiltration of the choroid will often cause a

positive obscuration of all details of the fundus.

With the advancing disease these objective symptoms are drawn in more vivid outline. The hyperemia deepens, the iris discoloration is unmistakable, reaction to stimuli is lost; the luster of this membrane, beautiful in health, disappears, while the lacunæ in its surface are filled up by swelling and infiltration, so that the iris has now a dull, uniform appearance and the pupil is fixed.

The pupilary rim of the iris is swollen, and if the plastic stage has been reached will appear uneven or irregular because of the bead-like lymph exudate on its uveal border, where it lies in contact with the anterior capsule of the lens. If the disease is one of a markedly plastic type the capsule becomes involved in the inflammatory process and loses its perfect transparency. As the disease advances the aqueous humor becomes muddy from the products of inflammation poured from the iris into the posterior and anterior chambers, and the pupilary area is filled with masses of lymph which prevent all ophthalmoscopic study of the fundus.

The conjunctival injection has advanced to complete, uniform redness, and the zone of deeper vessels is more pronounced. There is profuse lacrimation.

Accompanying these obvious manifestations of disease there is a group of subjective symptoms which, once met with in their most pronounced forms, can never be forgotten.

The photophobia increases as the disease advances until a stray ray of light from a crack in the door or window or night-lamp is quite distracting, throwing the patient into paroxysms of increased suffering. The ocular pain grows more intense and radiates throughout the branches of the fifth, to nose and teeth and scalp, the root of every hair seeming attached to a terminal nerve branch. There is profuse lacrimation. These, together with the outrageous hemicrania, which extends to occiput and nape of the neck, often radiating to the shoulders or down the spine, form an *ensemble* of symptoms equaled in the indescribable suffering of the patient by few other forms of disease.

The dull pain and distress of the daylight hours are relative comfort when compared to the acute suffering during the night. As twilight fades into darkness the general nervousness of the patient and the pain increase, until by nine or ten o'clock he throws himself in restless pain about the bed. At midnight his suffering has reached a point which he conceives to be unbearable. But not so. As the hours advance he becomes more nervous with each tick of the bedroom clock, and the acuteness of his suffering grows with the night—an increasing agony. He walks the floor in despair until the dawning day brings exhaustion, a dulling pain, and troubled sleep, from which he awakes to another day of dull pain, thankful for even this respite as he recalls to mind the torments of the night, but with nervous dread looks forward to its repetition.

Duration: a week, two weeks, a month. Result without treatment: an occluded and excluded pupil—*i.e.*, occluded pupilary area by masses of semiorganized lymph; the anterior and posterior chambers separated by an annular synechia, which disturbs completely and effectually the entire mechanism provided for the normal nutrition of the eye, so that to the picture of acute plastic iritis must be added for study the equally interesting conditions we may designate as the sequelæ of iritis, viz., recurring iritis, secondary glaucoma, a narrowing field of vision, blindness.

When the suffering of the patient has been mitigated by treatment and the sad termination in blindness prevented, there is a sequel of the disease which should be borne in mind. The refraction of the eye is often changed by an attack of acute iritis. I have seen a hypermetropic astigmatism disappear, being replaced by myopia with astigmatism and a complete change in the direction of the principal meridians of the cornea.

THE TREATMENT OF IRITIS.[1]

BY S. LEWIS ZIEGLER, M.D.,
Attending Surgeon, Wills Eye Hospital.

The treatment of iritis is necessarily somewhat routine in character, although at times it must be modified by certain prominent etiological factors present. It is a disease that manifests itself in protean forms, about eighty per cent of the cases being plastic in character. The therapeutic measures to be discussed may be divided into (1) local, (2) systemic, and (3) surgical. The consideration of each one of these must necessarily be brief.

I. *Local Measures.*—The local treatment of plastic iritis (rheumatic, spongy, and syphilitic) has for its keystone the prompt and effective use of a mydriatic. Atropine sulphate gr. iv to f℥j should be instilled until the pupil dilates widely. If synechiæ have already formed they will probably break loose. It is claimed that the essential therapeutic effect is the dilatation of the pupil and the putting to rest of the iris tissue, but doubtless the real therapeutic factor is its sedative action on the lymphatic stasis present. Anyhow, it relieves pain and hastens resolution and should be pushed as much as possible, always being on the lookout for the development of poisonous symptoms, especially in hot or humid weather, when its effects are liable to be intensified, and particularly in the case of small children.

The most prominent symptoms of poisoning to be noted are:

1. Flushing of the face.
2. Dryness and parching of the throat and mouth.
3. Inability to articulate distinctly.
4. Dizziness.
5. Delirium, chiefly at night, and ataxic in character.
6. Irregular elevation of the temperature.
7. Edema of the lids and face, with or without redness, and resembling erysipelas.
8. A skin eruption resembling scarlet fever, but not followed by desquamation.
9. A sudden rise in tension, or other glaucomatous symptoms.
10. After long-continued use, chronic catarrhal conjunctivitis, with or without granulations.

The presence of one or more of these symptoms should put us on our guard at once. If the patient has an idiosyncrasy against the use of atropine, or it is not otherwise well borne, hyoscyamine sulphate may be substituted with good effect.

The supraorbital neuralgia is usually nocturnal in its manifestation, and may often be relieved by the old-fashioned belladonna ointment, spread over the eyebrow, and covered by dry heat. A more modern analgesic, however, is found in hyoscine hydrobromate, which I have often used with almost magical effect, when instilled in the strength of gr. ¼ to f℥j.

In addition to the mydriatic, hot stupes are most valuable to relieve the pain, congestion, and sluggish circulation. A towel should be wrung out in hot water (kept hot) and held to the eye for from ten to thirty minutes three times a day. This application encourages rapid absorption and increases the action of the mydriatic.

Leeching is absolutely necessary, in many cases, to relieve the overloaded blood-vessels and lymphatics, especially where the congestion creates a muddy-colored iris. As soon as this depleting effect manifests itself the action of the mydriatic is greatly enhanced, and the "brow-pain" and weight in the eye begin to disappear.

If carefully watched, dionin, 5 per cent, may be instilled as a lymphatic stimulant or lymphagogue, and to induce a resolvent action.

Positive galvanism, applied to the affected eye, often gives marked relief at the first sitting, and its continued use may prove as valuable for therapeusis as for relief of pain.

While we no longer confine these pa-

[1]Read before the Wills Hospital Ophthalmic Society.

tients in a darkened room, it is well to have them wear an eye-shade, or "London smoke" glasses, as the admission of too much light is both dazzling and painful to the afflicted eye.

II. *Systemic Treatment.*—Internally, calomel is our sheet-anchor, particularly in the early stages. I usually order gr. ¼ four times a day for five days, and if the symptoms are still marked, repeat the dose for a second period of five days.

Later, if antisyphilitic treatment is indicated, daily inunctions of unguentum hydrarg. ʒj are ordered, and ascending doses of potassium iodide, ranging from gr. v to gr. c (well diluted) t. i. d., are given for a considerable period of time (six months to two years).

If the rheumatic tendency is more pronounced, sodium salicylate, aspirin, or salacetin may be administered liberally. Colchicum is also valuable, especially if there is a gouty taint.

If the circulation becomes sluggish and the condition more or less chronic, turpentine in five- to ten-minim doses will often act as a stimulant. In the traditions of Wills Hospital this drug is used in a form known as "Dr. McClure's mixture," which is merely an emulsion of turpentine, with or without quinine. I have seen this mixture clear up a case of sympathetic iritis that would not yield to any other treatment.

Diaphoresis will of course increase lymphatic action, and thus stimulate the activity of other remedies. Hypodermic injections of pilcocarpine gr. ⅛, guarded by strychnia nitrate gr. 1/30 to support the heart, are very efficient. Vapor baths are similarly employed.

If the pain persists in spite of the antiphlogistic treatment, we may give hypodermic injections of morphia; or employ antipyrin or chloral internally, both of which possess analgesic effects. I have already referred to the local instillation of hyoscine hydrobromate for the same purpose and to the application of belladonna ointment in "brow-pain."

Serous iritis or iridocyclitis runs a more chronic course, and does not yield to treatment so readily. Atropine must be used with great caution, as glaucomatous symptoms may develop at any moment, when eserine would be indicated. Calomel, salicylate of soda, and turpentine may be used singly, seriatim, or conjointly. I rely chiefly, however, on positive galvanism, which appears to shorten the course of the disease to three or four weeks. This is doubtless due to a mild electrolytic action, which decomposes the exudates present, stimulates the lymphatic activity, and thus promotes absorption. The current strength to be preferred is about 60 volts controlled down to 1 milliampere, and applied for ten minutes once a day.

In gummatous iritis specific treatment must be pushed to its full limit with the greatest vigor. Here again atropine must be instilled with great caution and watchfulness, for the luetic deposit may suddenly block up the drainage and glaucoma ensue. In fact I have seen glaucoma develop in spite of treatment, and without the use of atropine, and enucleation alone gave relief. A section of the globe showed that the gummata were located in both the iris and ciliary body. Eserine may be indicated from the start.

In tuberculous iritis atropine may be used to dilate the pupil. I have not found any internal medication so efficacious as hypodermic injections of tuberculin. The proper dosage is two to five minims, in thirty minims of water, at intervals of from three to ten days, depending on the amount of local reaction, the systemic disturbance, and other annoying symptoms, all of which grow less at each successive injection. It is not only a reliable diagnostic test, but a valuable therapeutic agent. I prefer Koch's "old tuberculin," and not the more virulent and dangerous "T. R."

In traumatic iritis heat is contraindicated, and cold compresses constantly applied (day and night) are most efficient. Calomel gr. 1/10 every hour or two hours is valuable. Atropine is generally indicated, but in the event of increased tension from

swollen lens cortex, or exudative deposit from the contusion, it may be contraindicated.

In gelatinoid iritis the use of thyroid extract may encourage the extremely sluggish absorption. Dry heat is also valuable, while galvanism may stimulate the reabsorption of the gluey exudate.

In chronic or recurrent iritis, nasal obstruction and accessory sinus disease should be carefully searched for. I have records of several such cases yielding to intranasal treatment.

III. *Surgical Procedures.*—In chronic iritis, or in the recurrent form, if marked posterior synechiæ or pupilary exclusion are present, iridectomy is often indicated. This is often performed with great difficulty, as the iris is either bound down very tightly and only yields when the lens capsule tears, or the iris is rotten and breaks off in small fragments each time it is grasped by the forceps. Careful and patient manipulation will often determine a successful operation and a permanent result. In old cases of sympathetic inflammation, however, there may be recurrent attacks of serous iritis, with occlusion of the pupil and even cataract. Here it is better to postpone the operation until the eye is perfectly quiet.

In traumatic iritis, if the iris is torn, bruised, or prolapsed, it is better to excise the injured portion at once, and carefully dress back the edges of the coloboma so that no incarceration or blocking up of the corneal wound may occur.

In conclusion I may repeat: iritis occurs in such protean forms, and is so manifestly hybrid in its types, that the treatment must be based upon the essential elements in the symptom-complex exhibited in each individual case. The prognosis is generally good.

STOVAINE SPINAL ANESTHESIA.

BY GASTON TORRANCE, M.D.,

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While in Europe last fall it was my privilege to see stovaine used by a number of well-known surgeons and gynecologists.

In England, Mr. Moynihan, of Leeds, and Mr. Barker, of London, both used it. Mr. Barker has used it in 120 cases at the University Hospital, and expressed himself as being pleased with results. He has had no deaths.

Mr. Moynihan told me that he was using it in old men for the removal of the prostate by the suprapubic route, where he was afraid to give a general anesthetic. He has used it in 14 cases without an accident.

In Paris, Tuffier and Faure have both had considerable experience in spinal anesthesia. I saw Dr. Faure using stovaine at the Hospital Tenon, in vaginal operations. He told me that he was not using it in abdominal surgery, but did not hesitate to use it where he wanted a quick, safe anesthetic. Tuffier reports 530 cases without a death.

Professor Kocher did not use it during my visit to his clinic in Berne.

Dr. Kümmell, of Hamburg, reports 186 cases without mortality. He uses it in children five years of age, and has used it in adults up to eighty.

Professor Krönig, of Freiburg, was one of the most enthusiastic advocates of stovaine spinal anesthesia that I met in Germany. He has used it in more than a thousand cases, and I believe has not had a death that could be justly charged to stovaine. His method of administration is most careful. The patient is given scopolamine 0.0003 gramme and morphine sulphate 0.01 gramme hypodermically, two hours before operation. Plugs of cotton are put in the ears, and the patient's eyes are bandaged. After the needle is introduced an inverted Y-shaped glass tube is

attached and the spinal fluid allowed to rise in the long arm of the tube; the intraspinal pressure is then noted. The syringe holding the stovaine solution is attached to the short arm, and the stovaine is slowly forced through into the spinal canal. One minute is allowed for the introduction of the fluid, and when the needle is removed the spinal fluid in the long arm of the tube is thrown out; that much fluid is removed from the spine, which equalizes the pressure. Professor Krönig uses stovaine made by Billon, of Paris, of the following formula:

STOVAINE BILLON.
Borate d'epirenane, 0.00013;
Stovaine, 0.04;
Chlorure de sodium, 0.0011.

Each tube is hermetically sealed and holds enough to anesthetize an adult for about an hour and a half.

Professor Döderlein, of Tübingen, uses practically the same methods as Professor Krönig. He reports 44 cases—no deaths. He was using Riedel's preparation of stovaine.

Professor Von Rosthorn, of Heidelberg, is using stovaine exclusively in his clinic, both for abdominal and plastic work. He reports 107 cases with no mortality.

In Munich I saw it used by Professors Schmidt and Klein. Both expressed themselves as being pleased with it.

Professor Zweifel, of Leipsic, was using novocain, and said that he was better pleased with it than with stovaine. I saw him do a number of abdominal sections, and in nearly every case there was marked nausea, which interfered, to some extent, with the operations.

Professor Israel, of Berlin, is using stovaine and tropacocaine in his clinic. Stovaine is used also in Von Bergmann's clinic.

Under "New and Non-official Remedies" the *Journal of the American Medical Association* of December 1, 1906, gives the following description of stovaine (benzoyl-ethyl-dimethylaminopropanol hydrochloride): "It is prepared by causing a reaction of benzoyl chloride on the *a*-dimethylamino-pentonal-*b*, which is itself the product of reaction of ethylmagnesium chloride on methylaminoacetone.

"It crystallizes in small, brilliant scales, which melt at 175° C. (347° F.). It is extremely soluble in water and easily so in methyl alcohol and acetic ether, but requires five parts of absolute alcohol for solution, and is only slightly soluble in acetone.

"It is quite stable, and its solutions may be sterilized at 115° C. (239° F.) without suffering decomposition.

"The aqueous solution is slightly acid to litmus, neutral to methyl orange. It is precipitated by all the alkaloidal reagents, and is decomposed by even very dilute alkalies.

"It is incompatible with alkalies and all alkaloidal reagents.

"*Actions and Uses.*—Stovaine acts as a local anesthetic of about the same power as cocaine, but dilates the blood-vessels, whereas cocaine contracts them and exerts a tonic action on the heart. It is only one-third to one-half as toxic as cocaine.

"It is used as a local anesthetic; while most reports are favorable, one case of gangrene has been reported following the use of 10-per-cent solution.

"*Dosage.*—Internally, 0.002 gramme (1/30 grain) as pill. Locally, it may be used in the eye in 4-per-cent solution, and applied to other mucous membranes, as in laryngology, in from 5- to 10-per-cent solution. For hypodermic injections for local anesthesia, it can be used in 0.75- to 1-per-cent solution."

My personal experience with stovaine has been limited to a few cases. I have adopted the following methods in using it:

The patient is prepared the night before as for a general anesthetic. The field of operation and the lumbar region are both scrubbed and a wet antiseptic poultice applied.

Two hours before operation scopolamine gr. 1/100, with morphine sulphate gr. ¼, is given hypodermically. The ears are

plugged with cotton, and colored glasses put on the patient.

I use Kocher's 5-Cc. glass syringe with needle 3½ inches long, which I had made in Berne after his pattern.

When ready to give the stovaine, the patient is allowed to sit on the side of the table with his feet on a chair, elbows resting on his thighs. The back is again scrubbed, using permanganate and oxalic acid. Sterile towels or laparotomy sheets are wrapped around the patient. My gloves, syringe, and needles to be used for the anesthesia are boiled separately. The neck of the flask or tube holding the stovaine is broken and the fluid drawn up into the syringe before the puncture is made.

A line drawn from the crest of one ilium to the other posteriorly crosses the body of the fourth lumbar vertebra. The needle should be introduced just above this line between the third and fourth lumbar vertebræ about two-fifths of an inch to one side of the median line to avoid the strong interspinous ligament, which, in some cases, deflects it (Bardeleben). The needle will enter from 1 4/5 to 2 4/5 inches, and should carry a wire, which completely fills its cavity, to prevent plugging with the skin or tissues. The wire should be withdrawn just before reaching the dura, and the needle slowly introduced until the spinal fluid begins to flow. Usually a few drops are allowed to escape, and then the syringe is attached and the plunger slowly withdrawn, allowing about one cubic centimeter of the fluid to mix with the stovaine solution; then the fluid is slowly forced out, taking one minute for its introduction into the spinal canal. After the needle is withdrawn a sterile gauze pad is applied to the puncture with some adhesive substance. The patient is allowed to sit up for two minutes more, and is then generally ready for the operation to begin.

The anesthesia usually lasts about an hour and a half. In the Heidelberg clinic the patient is immediately put in the Trendelenburg position, and I saw no bad effects from it during the time I spent there.

Case I.—W. W., male, aged thirty-five, admitted to St. Vincent's Hospital January 11, 1907, with intestinal obstruction of a week's duration. He had vomited a great deal, and had marked distention.

After being thoroughly prepared, scopolamine gr. 1/100, with morphine sulphate gr. ¼, was given two hours before operation. A bandage was applied over his eyes, and plugs of cotton put in his ears.

The stovaine was given, and the operation begun as soon as he laid down and the field of operation could be prepared.

The whole of the small intestine was removed from the abdominal cavity, and careful search made for the obstruction, which proved to be a freely movable flap of peritoneum behind the ileum just where it joins the cecum. This pocket was closed with catgut sutures, and the appendix being thickened and inflamed was removed.

A large portion of the bowel was much distended and of a bad color, but resection was out of the question on account of the patient's condition. The abdomen was closed with drainage.

During the operation there was absolute insensibility to pain. The abdominal muscles were well relaxed. There seemed to be less hemorrhage than with a general anesthetic. Respiration was normal. The pulse averaged about 100, and was of good volume. There was practically no shock. There was no vomiting. The patient asked for and was given a glass of water before being removed from the table.

He was just on the verge of fecal vomiting when brought in, and I believe it would have been precipitated had we given ether.

After being put back to bed he was cheerful, and seemed to be in quite as good condition as before the operation.

No purgatives were given. Morphine, atropine, and strychnine were given hypodermically, and salt solution by enema every three hours. Small quantities of

cold water were allowed by mouth. He perspired freely, and in twenty-four hours had a slight movement of the bowels. The following day the bowels moved freely, and to all appearances the patient was making a good recovery, except for a continuous temperature of 101° F., due to a low grade of peritonitis from extension through the distended and discolored portion of the bowel. This continued with no decided elevation of temperature until the eighth day, when he died of exhaustion and peritonitis.

Post mortem this portion of the bowel was found matted together and had perforated, but there was no free fecal material in the general peritoneal cavity.

CASE II.—Mrs. B., aged forty-three, was admitted to St. Vincent's Hospital January 13, 1907. About a year previous I had removed her appendix and left ovary under ether. She was very much nauseated for a week and dreaded taking the ether again, and was much pleased with the idea of having the spinal anesthesia used. No morphine and scopolamine was given, as morphine has always produced severe nausea.

The following morning, after having had the preparation used in the previous case, stovaine was injected into the spinal canal, and the anesthesia was complete at the end of three or four minutes. I then proceeded to open the abdomen in the median line to one side of the old incision. On opening the abdomen some adhesions were found between the small intestine and abdominal wall, and the dissection and suturing over of these denuded surfaces prolonged the operation considerably. I did a supravaginal hysterectomy, and removed the right ovary. The operation lasted one hour and twenty minutes. The last ten minutes she began to complain of pain, and especially in the closure of the peritoneum. The wound was closed in tiers with chromic catgut, and Mechel's clamps were used to close the skin. She joked with the nurse during the operation, and showed practically no shock from being conscious. I used the Trendelenburg position. There was no nausea following the operation, and on the whole she was very much more comfortable than after the previous operation. The heart's action and respiration were not affected by the anesthesia. As in the previous case the abdominal muscles were well relaxed, and there seemed to be less hemorrhage from the incision than is usually seen in general anesthesia.

CASE III.—Mrs. L., aged thirty-two, was admitted to St. Vincent's Hospital January 8, 1907, and the following morning scopolamine gr. 1/100 with morphine sulphate gr. ¼ was administered two hours before operation, and the stovaine given as in the previous cases. After opening the abdomen and dissecting up the tubes (double pyosalpingitis), it became necessary to give ether, as she was very nervous and hysterical. After getting her under ether she was placed in the Trendelenburg position, but her respirations became very shallow, and she had to be raised up by inverting the table. Strychnine was given hypodermically, and the operation was finished without difficulty; her breathing continued good. The abdomen was closed as in the above case, with a small Mikulicz drain in the pelvis. The head of the bed was slightly elevated, and the strychnine was given every three hours during the following night. She made an uneventful recovery.

CASE IV.—L. D., aged twenty-three, was admitted February 12, 1907, to St. Vincent's Hospital, with double pyosalpingitis, with the uterus retroverted and bound down by a mass of adhesions. Scopolamine gr. 1/200, and morphine sulphate gr. ⅛, was given hypodermically two hours before, and repeated just before the patient was brought to the operating-room.

The stovaine was used and an attempt made to begin the operation, but as she was hysterical and nervous and insisted upon being put to sleep, I was forced to give her ether, notwithstanding the fact that the anesthesia seemed to be fair.

I did Von Rosthorn's operation, performing a complete hysterectomy, and

passing a drain out through the vagina and sewing the peritoneal flap from the anterior surface of the uterus to the brim of the pelvis and to the rectum, completely shutting off the raw and oozing surfaces in the pelvis from the general peritoneal cavity—*i.e.*, making a new floor to the peritoneal cavity.

She made an uneventful recovery and was sent home at the end of two weeks.

I have collected from the literature 5350 cases with 5 deaths.

THE RELATIVE VALUE OF THE OBSTETRIC FORCEPS AND VERSION AS METHODS OF DELIVERY.[1]

BY WILLIAM H. WELLS, M.D.,

Demonstrator of Clinical Obstetrics in the Jefferson Medical College; Chief Gynecologist to the Mount Sinai Hospital; Assistant Obstetrician to the Jefferson Medical College Hospital.

In discussing the relative value of the obstetric forceps and version as methods of rapid and safe delivery, we presuppose that the operator has had a fair experience with the use of both methods of delivery, having acquired at least a moderate amount of skill, and where forceps is concerned the instrument used is well made, of good length, and of one of the standard patterns upon which the operator may rely. We mention the latter point because of the following case:

Some four years ago the writer was called one night by a young physician to deliver a primigravidous woman. My young friend in attempting to deliver the patient with a pair of short, light-weight Simpson forceps had broken the anterior blade within the uterine cavity. The forceps did not have an axis traction appliance. He said he thought the piece of blade was in the anterior part of the uterine cavity. When first seen the patient had been in labor about ten hours, was exhausted, and not under an anesthetic. The forceps had been applied because of weak uterine contractions. The head was not engaged, although the pelvic measurements were normal and the head could be brought into the pelvic inlet by pressure. I could not feel the piece of forceps blade by palpation because the bladder was half full of urine. The urine was drawn off, and the patient anesthetized, after which the child's head was gently brought down and rotated far enough to apply the Tarnier forceps. Strong traction was made in a direction downward and especially backward, so as to avoid the piece of forceps blade. The child was born living and well, having suffered no injury whatever; neither was the delivery an especially difficult one. The piece of forceps blade was found on the anterior uterine wall, the broken ends resting downward, as I remember it, against the pubic bone. After withdrawing it I examined the interior of the uterus, and found that no damage whatever had been done. Both mother and child did well.

In the majority of cases we believe that in the mother's interests forceps delivery is safer than version, as far as the operation itself goes. There is less danger of tearing the soft parts of the birth canal, and the slow traction gives the canal time to dilate. In cases, however, in which rapid delivery is necessary in the interests of mother or child, or both, version properly performed will be the better method of delivery.

When weak labor pains delay the expulsion of the child in a patient in whom the fetal vertex is anterior, the os fairly well dilated, and the mother in good condition, stimulants having been tried and having failed, these are the ideal cases for forceps delivery. If the head is engageable above the pelvic floor axis traction should always be used. When the occiput

[1]Read at a meeting of the Obstetrical Society of Philadelphia, April 4, 1907.

rotates posteriorly to the transverse diameter of the pelvic inlet, it may be rotated slightly anteriorly by the hand, and the forceps, preferably the Tarnier, may be applied; downward traction in the axis of the pelvic inlet will usually favor anterior rotation of the occiput. Occasionally in this class of cases some sort of loose lock instrument, such as the Simpson, may be used providing the instrument is long enough and has an axis traction appliance. Personally we have had good results in its use. When the occiput has rotated directly backward in pelves of normal size and with no impaction, the forceps should be used in the majority of cases; the Tarnier being here the instrument of choice. Delivery by the forceps where the head is rotated posteriorly takes time, however, and is well adapted for cases in which the child is alive and strong and the mother in good condition. There is a certain proportion of women with slightly flattened pelvis, or instances where mother and child could not stand a long forceps delivery, and in these cases podalic version offers good results providing the soft parts are well dilated.

In flat pelves where the anteroposterior diameter is contracted to such a degree as to retard labor, but not sufficiently to actually prevent the passage of the head, labor may be retarded to such an extent as to cause exhaustion. In such cases the head attempts to enter the pelvis with one of its anteroposterior diameters in relation with the transverse diameter of the inlet, the lateral obliquity of the head being very much increased. In such a position forceps are dangerous; the blades should never be applied over the forehead and occiput, and the shortened oblique diameters prevent turning the head manually so as to properly apply the forceps. Here podalic version will often save the child's life without materially endangering the mother's. On the other hand, in justominor, generally contracted pelves, the contraction being slight and the head not abnormally large, there is no long transverse diameter in which to turn the child, and in such cases, where the mother cannot deliver herself, the forceps, frequently reënforced by the so-called Walcher's position, will give much better results than version. Labor in both flat and justominor pelves should, however, be most carefully studied: it is so easy to attempt delivery in pelves too small for the child to pass through. External pelvimetry, while some sort of a guide, is not infallible; frequently the external measurements may be normal or nearly so, while the actual diameters of the inlet may be much decreased, due to abnormal thickness of the bones or muscles. In doubtful cases we should not content ourselves with external pelvimetry only, but should measure the internal conjugate by vaginal examination, internal pelvimetry, and by sweeping the finger around the head, which should be also fitted into the pelvic brim. It will be frequently necessary to have the patient under an anesthetic to do this properly.

We repeat that these patients with contracted pelves should be studied with care, and if the operator is doubtful that version or forceps delivery can be safely performed, the patient should be delivered by abdominal incision or craniotomy. The former under proper conditions endangers the patient very little more than does a well-performed forceps delivery in a normal case, and much less than a complicated and lengthy attempt at forceps delivery or version where the pelvis is contracted.

Face presentations, as long as they occur in pelves of normal size, the extension being good and the chin rotating well to the front, usually deliver themselves without help after a slow and tedious first stage. When, however, in primigravidous women whose birth canals are not well dilated or dilate slowly, and uterine contractions are inefficient, the chin may not rotate. In these cases manipulations must be tried to bring the chin to the front of the transverse line, and if these efforts fail podalic version will frequently save the child and shorten the sufferings of the mother by several hours. When the

patient is a multiparous woman with well dilated birth canal, slow first stage, the child's head being well extended and the chin anterior, forceps may be used to advantage to cut short a labor which if left to nature might possibly exhaust the patient. The advantage of the Tarnier instrument in this case is that the rotation of the chin may be completed by the rotating action of this instrument. The blades should be accurately fitted to the sides of the child's head. In our own experience we must confess to a preference for podalic version in a majority of these cases.

In shoulder and arm presentations, the head being in one iliac fossa, the breech being in the opposite upper uterine quadrant, much valuable time is lost in trying to push up the head so as to bring it into the inlet sufficiently to apply the forceps; especially is this the case if the membranes have ruptured and the patient has been in labor for some time. Podalic version by the method of Braxton Hicks may here be done with great advantage, the child being more frequently saved.

In cases in which the brow presents, the head being partly extended, birth is impossible. In many of these cases attempts either to flex the head, trying to convert it into a vertex presentation, or to extend it and rotate the chin anteriorly, endeavoring to change it into a face presentation, result in failure; thus valuable time is lost. In these cases podalic version skilfully performed offers the child a better chance for life than do prolonged manipulations upon its head, always with the possibility of pressure on the cord and consequent asphyxia.

There can be little doubt as to the value of podalic version in cases of central or partial placenta previa. When, however, the child presents by the vertex and the head is pressing well down on the placenta, it is often better to apply forceps and deliver quickly rather than to run the danger of dislodging the placenta entirely by version. Possibly it may offer the child a rather better chance too. If the head is high up above the pelvic brim, or if the child presents by a part of its body other than the vertex, or there is slow dilatation of the cervix, version should be performed.

Every one who has tried to replace a prolapsed umbilical cord after rupture of the membranes knows how difficult it is to keep the cord in the uterine cavity after replacement, no matter what methods have been used. A large number of children are always lost in these cases. Various methods of delivery have been tried: some operators prefer to place the patient in the knee-chest or Trendelenburg position, replace the cord, then bring down the child's head and extract with forceps. The writer's preference, however, is for podalic version in these cases; we have delivered a larger number of living children by version than by any other method.

Tumors or occlusion of the vagina or uterus, or of the latter extending into the vagina, are contraindications to version, but in a very large number of cases they are to forceps delivery also, so that this class of cases must very largely be treated by abdominal section.

Twice in our experience we have met with cases in which the caput succedaneum was of excessive size. In both instances the mother's pelvis was normal in size or nearly so. The exact cause of such an enlargement of what is usually a small and inoffensive tumor we are unable to state. In one case the tumor projected beyond the bones of the head for a distance of nearly two inches. Application of the forceps resulted in the slipping of the blades. Podalic version was resorted to and gave living children in both cases.

Hemorrhage from a placenta partially separated at its upper margin, the bleeding occurring between the membranes and the uterine wall, constitutes a dangerous complication of pregnancy. Version as a rule in such cases causes the mother to run the additional risk of entirely separating the placenta during the turning of the child. Here the method of preference would be to rupture the membranes, stimulate the uterus to contraction, and

deliver the child as soon as the cervix is sufficiently dilated. In a group of cases in which the mother must be delivered with some rapidity because she is the victim of heart, lung, or kidney disease, the method of delivery must depend much on the presentation, the time of pregnancy, and the general condition of the mother and child. As a rule, though, our impression is that less shock will follow a gradual delivery by forceps than by the more rapid one of version and extraction.

CONCLUSIONS.

Where rapid delivery is necessary, the pelvis being of normal size or flattened very slightly in the anteroposterior diameter, the transverse diameter being of normal size or increased, the cervix and vaginal canal dilated and well softened, version is preferable to forceps when mechanical interference is necessary. Among the special indications for version may be classed the following: Brow or face presentations with no rotation of the chin; certain cases of occipitoposterior position; parietal presentations; placenta previa, if the presenting part is high up in the pelvis and the soft parts dilate slowly; certain cases of deficient uterine contractions; prolapse of the cord; transverse positions; excessively large caput succedaneum; some cases of eclampsia.

Forceps delivery gives best results in the largest number of labors delayed by weak uterine contractions where interference is necessary, in the majority of cases of posterior rotation of the occiput. Forceps are also to be used in cases of rachitic, generally contracted, or in justominor pelves, providing the contraction is not great enough to prevent the head and shoulders of the child from passing through the inlet, and in those patients having certain constitutional diseases, when manual delivery is to be performed.

Neither forceps nor version should be attempted in any case of hydrocephalus or abnormally enlarged fetal body unless craniotomy or evisceration has first been performed.

CHLORETONE.

In *La Presse Médicale* of June 15, 1907, MARTINET publishes an article upon chloretone. After describing its chemical composition, which is well known to most of our readers, its solubility, and its physiological action, he points out that it may be used as a hypnotic in the dose of from 5 to 10 grains. The sleep which it produces is as a rule satisfactory, and lasting for a considerable number of hours. It is well borne by the stomach and has been employed successfully in many cases of the vomiting of pregnancy, given three or four times at half-hour intervals in the dose of one, two, or three grains. It is usually well borne, and has been employed with success in diminishing nervousness about the menstrual period, and also in cases of seasickness and gastric pain of a neuralgic character. It also possesses, according to Martinet, local anesthetic and antiseptic properties. It has been employed in dental caries with excellent results by saturating a piece of absorbent cotton with the following mixture and inserting it into the cavity of the painful tooth:

> Chloretone, 15 grains;
> Camphor, 15 grains;
> Essence of peppermint, 7 minims;
> Oil of cajuput, 75 grains.

It has also been employed as a sedative and anesthetic in cases of acute inflammations of the nasopharynx and larynx in liquid paraffine, in the proportion of 15 grains to 3 ounces of liquid paraffine. Sometimes it is used in association with the atomization of adrenalin solution. Lubet-Barbon and Fiocre have recommended its employment as an anesthetic in painful affections of the larynx, particularly in combating the difficulty in swallowing in persons who have marked tuberculous infiltration of the larynx, and also to diminish the pain which follows the use of the galvanocautery. The anesthesia lasts for from two to three hours. The antiseptic power of the drug is also useful in these cases as well.

EDITORIAL.

THE CONTROL OF HIGH ARTERIAL TENSION.

This subject, which is of surpassing interest and importance, not only to physicians but to surgeons as well, is once more called to our attention by an article which is contributed by Dr. Oliver to the London *Lancet* of May 18, 1907. We have repeatedly during the past few years called attention to this subject in the editorial and original articles of the THERAPEUTIC GAZETTE, and numerous authors have contributed original articles upon the same subject to many other journals in this country and abroad. There still exists, however, a lack of appreciation on the part of some members of the profession of the importance of this subject. In some instances all other lines of treatment fail because it is ignored. On the part of surgeons it not infrequently happens that careful urinary analyses are made prior to a surgical operation for the purpose of determining the condition of the kidneys, and the more cautious operators also have made an examination of the blood. Few of them, however, study carefully the state of the blood-vessels unless these parts of the body are so far advanced in atheromatous degeneration that their condition is so marked that it cannot be overlooked.

We are convinced that in many cases evil results follow the administration of anesthetics largely because high arterial tension of a chronic character has been ignored. Thus it not infrequently happens that a patient suffering from high arterial tension has a sufficient degree of cardiac hypertrophy to enable his heart to pump the blood into tightly contracted vessels, but when to the constant high tension is added the still further rise in blood-pressure produced by the administration of the anesthetic and the excitement attendant upon the approach of an operation, the heart, unable to stand the strain, undergoes dilatation, or is so overtaxed that it is seriously enfeebled. As a result pulmonary and circulatory complications arise, for which ether is given the discredit, when in reality the carelessness of the clinician is at fault, for the administration of nitroglycerin for a few days before the operation and immediately prior to the use of the anesthetic might put aside all difficulties.

So, too, physicians who are endeavoring to guide a patient through an acute illness due to an infection not infrequently ignore the fact that an arteriocapillary fibrosis in its early stages is forcing the heart to do an excessive amount of work, and are surprised when this organ breaks down, even although digitalis may be given. If the heart had not been stimulated to increased endeavor, but had been enabled to pump against a lower pressure, no such failure would have occurred.

We are interested further in Dr. Oliver's paper in that he supports the views which we have repeatedly spoken of in these columns, namely, that there is very little difference between the value of red and white meats in the treatment of renal disease and vascular fibrosis. Chemical analysis certainly shows no material difference, and clinical experience does not justify us, in the majority of cases at least, in cutting out red meats from the diet list and permitting white meats. Indeed, it may be said that there is only one type of food derived from the animal kingdom which is particularly deleterious in these cases, namely, concentrated gravies and soups which contain large quantities of salts and creatin and creatinin, all of which substances tend to raise pressure themselves or indirectly have a similar effect through an increased burden upon the kidneys in the act of their elimination. As they are of little value taking them from the diet list of the patient deprives him of nothing which is of advantage.

On the other hand, there can be no doubt that the use of a milk diet is advantageous in

many of these cases, and part of its advantage probably arises from the fact that a patient very seldom ingests enough milk in the course of twenty-four hours to provide him with the normal number of calories, or heat units, which are necessary for the maintenance of nutrition. The result is that the patient in reality is to a very considerable extent subjected to a starvation cure, and this starvation cure enables him to utilize or oxidize substances which have been stored up in his body in excess, and it also diminishes his arterial tension by depriving the body of sources from which it obtains large amounts of energy. In other words, such a modified starvation treatment acts as a nervous and general systemic sedative. Oliver also advocates the view that persons who have arrived at that time of life at which high arterial tension is prone to develop are not infrequently the users of larger quantities of salt than in their earlier decades, and he suggests, as did the late Sir William Roberts, that chloride of potassium be substituted for chloride of sodium as a table salt, since it acts as a cardiovascular sedative, whereas sodium chloride is more of a stimulant. Unfortunately, chloride of potassium is disagreeable in its taste to many persons, but some of its advantages may be obtained, and this gustatory disadvantage eradicated, by giving the patient a table salt composed of equal parts of sodium chloride and potassium chloride. Oliver himself advocates the following mixture as a table salt:

> Benzoate of lithium, 1 drachm;
> Potassium chloride, 2 ounces;
> Sodium chloride, 1 ounce.

Of this 30 grains may be used at a time.

There remain two other points in this connection which are of very considerable interest. First, Oliver thinks that tobacco-smoking is not particularly deleterious in these cases. When it can be given up without much suffering on the part of a patient, its use had better be stopped on general principles. But otherwise the good to be achieved by forbidding tobacco does not equal the discomfort caused by its withdrawal.

Last of all, we are glad to see that Dr. Oliver emphasizes very forcibly the importance of rest in the treatment of cases of high arterial tension. We are firmly convinced from personal experience in a considerable number of these cases that the cardiovascular sedatives which are useful in these chronic cases which are so often met with in high-strung, nervous individuals are almost useless unless at the same time they are administered a certain amount of rest of body and mind is insisted upon. After the blood-pressure has been lowered to the point desired, increased activity can be permitted and the vascular sedatives continued.

THE TREATMENT OF MUCOMEMBRANOUS COLITIS.

This state, which is one of the most obstinate which physicians are called upon to treat, does not yield in the vast majority of cases to any of the drugs which are commonly employed for the control of the various forms of diarrhea. It not infrequently is associated with a great deal of pain and abdominal distress, and not rarely the patient is so incapacitated that ordinary pursuits of life cannot be followed. Not infrequently, too, a considerable degree of emaciation occurs, and the patient, partly from the disorder of his digestive tract and partly because of an endeavor on his or her part to avoid foods which cause distress, gradually cuts down his diet list until he is actually upon a starvation diet, and even then suffers from abdominal disorder quite as much as when a more liberal diet was ingested. Of course, the exclusion from the diet list of foods which are manifestly difficult of digestion either in the stomach or in the bowels is essential in cases of this character. In the majority of them it will be found on careful investigation that the patient is not only in part neurasthenic because of the disease, but that he or she was in a neurasthenic state before the disease came on, and this neurasthenia is responsible for the mucomembranous colitis. In other words, in a certain pro-

portion of these cases the therapeutic measure which should be instituted is the resort to the rest cure, and when the patient gains a little strength by conserving the energies of the body it not infrequently happens that larger and larger quantities of nutritious food can be taken without the development of any disagreeable symptoms, and with the improvement in the general health coming from rest and increased feeding the mucomembranous colitis also diminishes, and ultimately recovery takes place with or without the assistance of drugs which before the patient took the rest cure had been entirely futile in their effects.

As has been pointed out in the Progress columns of the GAZETTE, one of the most useful methods of treating this condition is by means of irrigating the colon with normal salt solution as hot as can be borne, or with water containing 30 to 40 grains of zinc phenolsulphonate, or with one of the sulphur waters which are to be had at the various sulphur springs found in different portions of the world. Not rarely these patients are so poorly nourished that as soon as they are strong enough to stand it, skilfully given massage materially aids in increasing their nutritive processes.

CARBOLIC ACID GANGRENE.

Some years ago we called attention in a leading article to the development of carbolic acid gangrene in fingers and toes which were exposed to weak solutions of this drug, and later in a second article we called attention to the experience of certain French surgeons along these lines. It will be remembered that as long ago as 1871 Tillmann reported three cases of gangrene due to carbolic acid, and Leusser in 1896 collected 34 cases from literature in which such an accident followed the employment of solutions varying in strength from two per cent to the pure drug. In Harrington's article which appeared in 1900, and which was the first to call attention to this subject in the United States, he collected a series of 132 cases, of which 18 were observed by him, and in which he proved that an aqueous solution of carbolic acid of the strength of one to five per cent, when applied to a finger or toe for a number of hours in the form of a moist dressing or poultice, might produce gangrene.

Our attention is called to this matter once more by an article in the *British Medical Journal* of May 11, 1907, by Wallace, assistant surgeon to the Royal Infirmary of Edinburgh, in which he records nine cases of a similar character, except that in several of them the pure carbolic acid was used. In five others, however, the strength was not more than five per cent. In his cases the skin at first was dry, wrinkled, and grayish-white in color, and later became more shriveled and darker. The line of demarcation was marked by some hyperemia as it began to form, and amputation must not be performed until this line of demarcation is distinct. As a rule there was no swelling of the proximate portions of the finger or toe. Wallace thinks that in the present state of our knowledge idiosyncrasy can be the only explanation of these cases, because a great majority of patients to whom such solutions are applied escape without deleterious effects. As it is impossible to foresee this tendency in patients susceptible to the drug, and as there are substances equally good as antiseptic dressings, he deprecates the use of carbolic acid in any strength as an application to a finger or toe which has been injured.

CANCER OF THE BREAST.

Before the American Surgical Association at its meeting in Washington this year there were presented from various sources more or less complete statistical studies of the end results of operative treatment in cancer of the breast. The most important conclusions deduced from these figures, which taken in the gross were most discouraging, are to the effect that cancer of the breast is with rare exceptions curable, but curable only in its early stages; that when the axillary and supraclavicular

glands are already involved, cure by the most extensive operation cannot be expected; that in the absence of demonstrable glandular infection a cure may be looked for in about half the cases, providing the operation be complete, and that in the early stage of the affection, when the clinical features of cancer are not developed and the diagnosis is made by microscopic examination of the affected gland, even partial operations, such as removing the tumor, are highly successful.

It has been demonstrated that the three-year limit as a guage as to permanency of cure is subject to so many exceptions as to make it of little practical value, the figures in the Massachusetts General Hospital showing that 19 per cent of those who passed the three-year limit without evidence of recurrence showed this later. About 5 per cent developed recurrence six years or more after the operation.

PROLONGED PRIAPISM.

By the term priapism is meant an erection unaccompanied by sexual desire, sometimes, but not always, painful, and not followed by an emission. It may be transitory, as an expression of local irritation, such as that incident to an inflammatory lesion in or about the genital tract. Transitory priapism may be recurrent, coming night after night. Under these circumstances it usually denotes hyperesthesia of the lumbar centers, which are excited to action by a partly full bladder. This recurring transitory nocturnal priapism often represents but a slight exaggeration of the normal, and it is important only when it appears in the persons of neurasthenics or those given to brooding on the condition of the sexual organs.

Treatment aggravates rather than benefits it, and should be psychic rather than medicinal, although all cases should be examined for the detection of an organic lesion.

Prolonged priapism has long been recognized as a symptom of leukemia, at times an early symptom, yet it is so rare that the nature of the affection is not often recognized until other obvious and unmistakable symptoms develop.

Terrier and Dujarier (*Revue de Chirurgie*, No. 5, 1907) note that prolonged priapism has frequently followed excessive coitus. It many times develops without obvious cause and quite suddenly. At times the persistent affection is preceded by recurring attacks of transitory priapism. Usually the erection is a straight one, at times there is chordee. Nearly always the congestion is confined to the cavernous body, which becomes extremely hard, while the glans and the spongy body, though somewhat enlarged, remain soft. There is usually pain so severe as to interfere with sleep, associated with contracture of the perineal muscles and often with extreme restlessness. The pain has periods of recurring intensity. Commonly there is difficulty in passing the water, at times retention, though as a rule this function is not seriously interfered with, since the spongy body is not involved in the hyperconges-tion. Cure is the rule, sometimes occurring spontaneously after some weeks, sometimes not for a couple of months. Pain first subsides, and the swelling gradually grows less. Of the 48 cases of priapism collected by the authors, 31 recovered. Of these 5 afterward died of leukemia. Ten were operated on and cured. Two died whilst priapism persisted, one with suppurative phlebitis, one of fracture of the spine. Usually after recovery there was impotence. The prolonged priapism may be inflammatory, nervous, traumatic, leukemic, or idiopathic in origin. The condition commonly follows spinal lesions above the lumbar enlargement.

Tauszki's case is particularly interesting, since after a fracture of the cervical vertebræ priapism lasted for the eight days of life, and thirty-six hours after death was still found fully developed. There is at least one case in the author's collection in which syphilitic lesion was the cause of this condition. There are two cases in which priapism followed perineal trauma, one following a fall and the other a kick. Operation showed a small hematoma of the caver-

nous body in the latter case. A number of instances of priapism as an expression of local tuberculosis are on record.

In Terrier and Dujarier's collected 48 cases, 16 were due to leukemia, 9 are of unknown origin. Autopsy performed in cases has always failed to show thrombosis. The spongy body is distended by thick, black blood, very rarely containing small clots. A single incision is sufficient to evacuate the contents of both cavernous bodies, because their vessels communicate. Twice the colon bacilli have been found in the thick blood thus evacuated. An autopsy of one cured case demonstrated that the cavernous bodies were transformed into a fibroid mass without any trace of spongy tissue.

The authors reject the nervous theory for the great majority of cases, excepting in the instances of spinal fracture. A thrombotic theory is negatived by the results of operation since the blood, though retained in the cavernous bodies, does not clot. The authors are more inclined to accept the theory of a hematoma compressing the afferent veins; thus might be explained the priapism following coitus and defecation and even that occurring in leukemias, since such patients are particularly prone to hemorrhage. They acknowledge that this theory is not completely satisfactory since the curative effect of operation negatives it to an extent, and also the fact that the spongy body is practically immune.

As to treatment, the number of remedies indicated is a sufficient index as to the unsatisfactory effect of each and all. Although it is true the majority of cases recover, this result follows weeks and sometimes months of suffering. Operative interference seems indicated not only from the standpoint of prompt relief but also that of ultimate restoration of function. The authors advise surgical intervention as soon as possible, and apparently justify this by the figures. This intervention consists in incising the fibrous tunic of the cavernous body, emptying the blood, suturing this tunic most carefully, and closing the skin incision. The only complication likely to follow is that of infection. Should this occur the cavernous body must be drained. The authors believe that by this proceeding the transformation of the erectile cavernous tissues into a fibroid mass may be avoided.

REPORTS ON THERAPEUTIC PROGRESS.

ACCIDENTS FOLLOWING THORACENTESIS.

Exploratory puncture of the thorax is so frequently resorted to, and the results of the operation are so generally satisfactory, that the possibility of accident is hardly considered. Accidents do occur, however, of varying degrees of severity, and there may even be a rapidly fatal result. The removal of quite moderate amounts of fluids is well known to have produced sudden death, but the fact that this may follow simple exploratory puncture is not so well known. Some ten instances of this accident have already been reported, in eight of which a consolidated lung was the cause of the ambiguous signs, having been punctured by the needle. The explanation which has been accepted in most of the cases is that the sudden syncope is due to afferent impulses conveyed to the medulla along the vagus nerve, the terminal fibers of which have been rendered unduly sensitive by compression or inflammation. Russel, who advances this theory, considers that the pulmonary fibers are a more likely source of the impulse than the pleural. Death may be preceded for several days by unconsciousness or convulsions, due to the cerebral anemia produced by cardiac inhibition and extreme lowering of the blood-pressure. That there are other causes which bring on sudden death in these cases is shown in one reported by G. G. Sears in the *American Journal of the Medical Sciences* for December, 1906, in which the exploring needle could hardly have reached the pulmonary branches of the vagus, as a subsequent autopsy showed that the two surfaces of the pleura were

separated by a considerable layer of fluid. The patient presented a pleurisy with effusion, and aspiration had already been performed. When this operation was resorted to a second time the man immediately collapsed, becoming cyanotic and almost pulseless. He died fifteen hours later, and there were no evidences of any cerebral lesion.

Another accident which may result from thoracentesis is the production of a pneumothorax, of which a moderate number of instances have been reported, including four recent ones by Sears. The latter thinks that the comparatively small number of cases recorded by no means represent the frequency with which the accident probably occurs in practice, and he suggests that it often escapes recognition, as the patient usually recovers. Where a doubt exists it may be cleared up to a large extent by the use of the *x*-rays. When a fatal issue ensues it is probable that the pneumothorax did not contribute to this result, as there are ordinarily a sufficient number of other factors to bring this about. Various theories have been proposed to account for the accident, among which may be mentioned the entrance of air through the aspirating pump or an unguarded needle.

The causes of pneumothorax just enumerated may be avoided by a more careful attention to technique, but there seems to be no way of overcoming the danger of puncture of a solid lung by a needle used for diagnostic purposes. The fact should serve as a warning, however, against the reckless use of the exploring needle before the resources of a physical examination have been exhausted. When fluid is to be removed, the dangers of a pneumothorax may be avoided by allowing the fluid to drain away very slowly, and not insisting that every drop be evacuated. Especially in chronic cases, in which the lung does not expand promptly to take the place of the evacuated fluid, this precaution should be observed. Sears thinks that siphonage is decidedly safer when the effusion is large or has existed for a long time, and refers to Forlanini's method as being still safer, according to which sterile air is introduced to replace for the time being the fluid removed.—*New York Medical Record,* Jan. 26, 1907.

TREATMENT OF SCARLET FEVER.

In the *Archives of Pediatrics* for January, 1907, POLOZKER tells us that in some epidemics no matter what is done, nor how long the child is kept in bed and on a fluid diet and kept from all exposure, it will get nephritis. The renal inflammation is supposed to be due to some toxin of this disease circulating in the body; this in passing produces an irritative inflammation of the kidneys. For that reason the child should be made to pass very much diluted urine with lots of water, which will aid the kidneys, and in that way prevent inflammation. Warm baths, packs, rubbing, keeping the patient warm, sweating, making the skin active, should be employed to lessen the work of the kidneys. Often the hot bath should be followed by the pack.

A bath, the temperature at 102° or 103° F., or even higher, raising the temperature gradually for half an hour or longer, is good; and then the child should be wrapped in a hot and wet linen sheet, covered with blankets, and put in a warm bed, a cold cloth being applied to the head and kept there all the time. Then the child should be dried and rubbed well and a warm night-robe put on. Hot air or steam baths, and baking apparatus, the same as are used in rheumatism; are also advantageously used to produce diaphoresis. The diuretics usually do no good. Infusion of digitalis is about the best. Potassium acetate and calomel are also used, but the results are not encouraging in nephritis. Water or other fluids of any kind are just as good. Good daily excretions of urine and sweating are aimed at to prevent uremia.

When uremia does come with convulsions, free inhalation of chloroform, hot baths, chloral, and bloodletting should be used; dropsical effusions should be left alone.

Bronchopneumonic complications are treated as in other cases. For joint swellings, immobilizing, quiet, warmth, sodium

salicylate or sodium bicarbonate, oil of wintergreen, etc., are used as necessary.

To sum up, the writer would ask for:

First, the more thorough isolation of the patient.

Second, isolation for a while of other members of the family that come in contact with the patient, especially children.

Third, more care by the physicians and those who wait upon patients.

Fourth, a more thorough disinfection of premises after discharging a patient with scarlet fever.

Fifth, early diagnosis and more careful watching by the physician in mild cases of scarlet fever.

Sixth, the use of antistreptococcus serum in all cases showing any tendency to be severe, or accompanied by any complications, especially angina.

Seventh, the removal of hypertrophied or diseased tonsils and adenoids in children.

Eighth, the frequent examination of urine in scarlatinal cases.

Ninth, the continued care of the patient until all the desquamation is over and all complications are well; especially so with otitis.

Tenth, refusal of permission to go to school for the longest time possible consistent with education.

Eleventh, the refusal of surgical and obstetrical cases by the physician attending many cases of exanthemata. The time will come when the exanthemata will be treated by a specialist only, a man that will confine himself to these cases.

Twelfth, constant efforts to enlighten the laity upon the dreadful results of this disease and its complications, and for more rigid health laws.

THE USE AND ABUSE OF SODIUM BICARBONATE.

In the whole range of drugs in common use there is perhaps none the pharmacological value of which is considered less open to question than sodium bicarbonate. It has enjoyed a wide vogue for many generations in cases of gastric pain and hyperacidity of the stomach. It is important, therefore, to notice in the *Bulletin des Sciences Pharmacologiques,* 1906, No. 10, a monograph by Dr. Leon Meunier in which the value of this classic remedy in allaying gastric pain is discredited. Dr. Meunier states that the action of the drug is generally explained in the following way: Gastric pain is due to an excess of hydrochloric acid, which causes no inconvenience during digestion owing to its absorption by the food. But when the stomach is empty the acid begins to exercise an irritating action upon the sensitive nerves of the mucous membrane. The acid is neutralized, and as a result the pain is removed by the administration of bicarbonate of sodium at an interval of two, three, or four hours after a meal.

Having doubts as to the validity of this theory Dr. Meunier set himself to investigate both clinically and chemically the part played by the drug. He found that in nearly every one of 16 cases the most severe pain was experienced when the hydrochloric acid of the stomach was at a minimum. As bicarbonate of sodium was uniformly successful in relieving the pain, Dr. Meunier was led to attribute its beneficial action not to a mere neutralizing effect but to the production of carbon dioxide, which exerts a calmative effect on gastric pain. The acceptance of this hypothesis suggests the unsuitability of administering sodium bicarbonate alone as a source of carbon dioxide, since its therapeutic action is proportional to the quantity of hydrochloric acid present in the stomach, and is liable, therefore, to great variation. Moreover, the saturation of the hydrochloric acid by the sodium salt retards the progress of gastric digestion, as pepsin acts only in an acid solution, and it further retards intestinal digestion, as the acidity of the gastric juice has been shown by Pawlow to be the specific excitant of the pancreatic gland. This drug may thus reduce a patient to a state of alkaline cachexia, which led Trousseau to utter the dictum: "The abuse of alkaline drugs has done more harm than the abuse of mercury."

Dr. Meunier suggests that it is more ra-

tional to produce carbon dioxide in the stomach by means of tartaric acid and a mixture of carbonates, so chosen as to evolve the gas slowly and continuously without modifying the acidity of the gastric juice. The tartaric acid is prescribed in one-gramme powders, and the alkaline powders contain sodium bicarbonate 0.4 gramme, calcium carbonate 0.3 gramme, the hydrated magnesium carbonate 0.2 gramme. The patient is directed to add an acid and an alkaline powder separately, each to half a glass of water, and when the pain commences to take alternately table-spoonful doses of the acid and alkaline draughts. Dr. Meunier has found that gastric pain is most readily relieved by this treatment, whereas the administration of the alkaline draught alone is much less efficacious. From clinical experience he concludes that the carbon dioxide acts as a sedative by accelerating the evacuation of food from the stomach.—London *Lancet*, Jan. 19, 1907.

THE TREATMENT OF GONORRHEAL CONJUNCTIVITIS.

ETTLES in the *Lancet* of January 12, 1907, says that taking the ordinary case of an infant, commencing on the third day, we find the usual condition: the upper lid red, glossy, edematous, overhanging the lower; the lids gummed by dried matter, the scarlet villous palpebral conjunctiva, and the ropy pus. The microscope may be used to clinch the diagnosis, but it is a matter of scientific rather than therapeutic interest. What we at once look at is the cornea, and as to this we have a rule—almost a canon of surgery—"if the cornea is clear a favorable issue may be predicted." The neonatal cornea is exceedingly vulnerable, the more so as there are no tears to protect it, and the affected infants are so often syphilitic. At the best the cornea is not remarkable for vitality. Dependent for its nutrition on lymph diffusing along the interlamellar canals from the marginal vascular loops, any stasis in the circumcorneal vessels will threaten necrosis. In the infant it is thinner as to the substantia propria, and yet more so in the epithelium, where, instead of a transitional layer five or six cells thick, it consists of one layer of squames on a single layer of cuboidal cells. Hence we can understand how it is that whilst in the adult the ulcers are usually peripheral and are caused by the retention of pus between the corneal edge and the overhanging ring of chemosed conjunctiva, in the infant the ulcer is central from simple devitalization. That such stasis is present is clear from the researches of Schridde, Golesceano, and others.

On the question of remedies, beyond a universal admission of the specific value of silver salts, the atmosphere is almost polemic. For some time nitrate of silver was thrown in the shade by the newer organic preparations, whose universal goodness glowed so enticingly in our daily batch of circulars. But it was not long before it came into its own again, and we find Th. Saemisch, in the new edition of Graefe and Saemisch's "Handbuch für Augenheilkunde," discarding entirely the new compounds and pinning his faith to the old salt. In this he is supported by many of the foremost authorities, notably by Bernheimer, Baillart, and Alvarado. So far the strongest rival of the nitrate is protargol, and Saemisch's attack elicited a vigorous rejoinder from Pfalz, who has used protargol exclusively for six years and never required a solution stronger than 10 per cent.

In his own experience the author has learned to rely on protargol much more than on any of the others, but one difficulty —and it is indeed a drawback—is the need for its continuous use in a serious case. Whereas with the nitrate one can manage well with three applications daily, with protargol applications have to be made every half-hour, day and night, so that the patient, to say nothing of the attendants, is worn out by want of sleep. Apart from this, it is questionable if it is really equal to the nitrate, as witness the statement of Darier and Abadie, that whenever the cornea shows signs of necro-

sis they always resort to the nitrate. In the adult it is the author's practice, first, to irrigate the sound eye and then to instil 10-per-cent protargol before putting on the Buller shield, since we have no ground for assuming its freedom from infection. The affected eye is then irrigated thrice daily with 250 cubic centimeters of a solution of nitrate, 1 in 300, in warm distilled water. After each irrigation, applied by a glass undine, he instils two drops of 2-per-cent nitrate, and does not neutralize this with salt solution. In all adult cases he divides the external canthus. This may seem a heroic proceeding, but in view of the extreme danger to sight it is insignificant. One blade of a pair of strong scissors is pushed under the commissure as far as it will go, and the intervening tissues are severed at a single stroke. The outer tarsal ligament is very resilient and will elude the grasp of any but sharp blades. It is remarkable how greatly this facilitates the proper handling of a case. The cornea is at once removed from pressure, as the edematous lids are depleted by the free bleeding, and orbicular spasm is also done away with. Even more valuable is the free access to the retrotarsal folds. Contrary to what one would expect, when all swelling has subsided there is very little wound left and blepharoplasty is not needed, although that would be a simple matter if it were.

During the interval between the irrigations it is usual to employ frequently renewed dressings kept moist and cold on a block of ice. As a general surgical measure the use of cold topical applications is diminishing as a result of our increased acquaintance with the pathology of inflammation. This applies with unusual force to ophthalmic surgery, where there is *ab initio* a lessened vitality, in the face of which it is illogical to reduce the corneal temperature, and where, moreover, owing to the thinness of the intervening tissues, the temperature can be influenced to an unusual degree. Warm applications, on the other hand, maintain an impaired nutrition and are much more grateful to the patient than cold ones. When the stage of ocular gleet has been reached it will be found, as in urethral work, that simple astringents are of more use than the antiseptics. There are many which may be employed, but the author has found none superior to the old-fashioned "lapis divinus" rubbed on the inner surfaces of the lids.

THE TREATMENT OF PLEURISY WITH EFFUSION.

FORCHHEIMER, in the *Journal of the American Medical Association* of January 5, 1907, in speaking of operating for effusion, says that as to contraindications, he does not believe that any exist. The dangers of removing fluid from the chest are always insisted on; they certainly can be reduced to a minimum when the operation is performed with the necessary precautions. The writer has always used the aspirator, and in all his experience has never had a bad result. When the aspirator is properly used it is as safe as withdrawing the fluid with a trocar and siphon arrangement, and much more convenient, as the flow of the fluid can be controlled and no air can enter the chest. In addition to complete asepsis, the following precautions are essential to safety: The pressure within the aspirator should be reduced to its minimum in the beginning; it is rarely necessary to increase it at any time. As the intrapleural pressure with effusion never exceeds 40 millimeters of mercury (about two inches), anything below this will succeed in aspirating the fluid. So that at first the aspirator should contain air. If the negative pressure in the aspirator be too great the lung will be suddenly expanded, which may be followed by all those unpleasant consequences which are so thoroughly understood by all of us. Very little negative pressure is necessary in the aspirator, as it is more than likely that most fluids would flow from the pleural cavity without much suction, as when an opening is made the pressure of the fluid is the intrapleural pressure.

The next precaution to be taken, and just as important as the former, consists in not

attempting to withdraw all the fluid at one sitting. Aside from the fact that this is impossible, it would be unnecessary if it were possible. Furthermore, the drawing off of these large quantities of fluid at one time leads to dangerous conditions: albuminous expectoration, cough, syncope, acute edema of the lungs, death. No rule can be laid down as to how much fluid should be removed at one time. In a number of cases the author has found that the removal of a hypodermic syringeful of serum started absorption, and the case then went on to complete recovery. Stintzing and v. Gerhardt have also had this same experience. But no one would think of withdrawing so small a quantity of fluid when there are serious symptoms which are due to compression or other causes; here the removal of a sufficient quantity of fluid to cause the symptoms to disappear is all that is called for. This may be 300 cubic centimeters, it may be more; but under all circumstances not any more should be withdrawn than is necessary to remove all the symptoms. Absorption then will be started, and if this should not be the case another paracentesis should be done at some future time. In most cases it will not be difficult to determine when the second aspiration should be performed; when dangerous symptoms reappear, or when absorption does not take place in a few days, it is time to aspirate again. In following this method we do no harm, and we imitate the process of nature, as Alexander James puts it. The author states that in neglecting this precaution the usual accidents have occurred with siphonage as well as with the aspirator.

Another precaution to be taken is that the patient be in a position which approaches the recumbent as nearly as possible. When a large quantity of fluid exists in the pleural cavity there follows compression of the lungs, the heart, and of the larger blood-vessels. If this has existed for some time there has taken place a process that can be called compensatory. When the pressure is suddenly removed, the circulation is suddenly changed and serious conditions may arise, in part also due to the opening of blood-vessel areas that have been occluded. It is an established fact that in the recumbent position the human being can withstand changes in circulation better than in the upright. The reason for this is found in the fact that gravity has a decided effect on the circulation; if a patient has a quantity of blood withdrawn from his brain on account of a sudden determination to the central organs the effect will be less in a recumbent position than in an erect position.

Lastly, the patient should be carefully watched while the fluid is being withdrawn; if he coughs violently and spasmodically, if he has a feeling of constriction or feels faint or has great pain, the operation must be interrupted. After a little while, the symptoms having disappeared, another attempt may be made; if the symptoms again appear, the needle must be withdrawn and the patient put to bed.

After the fluid has been removed it is well to keep the patient in bed and under observation for a short time. Depending on the cause of the exudation he may, if no symptoms appear, be allowed to rise in a day or two. In all cases respiratory gymnastics should be advised. In tubercular cases the after-treatment should be that of tuberculosis.

APOPLEXY AND ITS TREATMENT.

In the *Clinical Journal* of January 16, 1907, GUTHRIE in speaking of the methods of treating cerebral compression caused by hemorrhage advises that in traumatic cases, when the bleeding is from a meningeal vessel, and upon the surface of the brain, the obvious course is to trephine, close the bleeding vessel, and turn out the clot. The method in such cases has been strikingly successful. This is inapplicable in cases of spontaneous intracerebral hemorrhage. In such cases palliative trephining has been suggested, with a view to lessening intracranial pressure; but Hill has shown that removal of a small circle of bone gives no relief, for the brain simply presses up against the trephine hole and closes it like a valve. Re-

moval of a large portion of cranial bone might relieve by allowing compensatory expansion of the volume of the brain; but so formidable a procedure is quite unjustifiable in practically all cases of intracerebral hemorrhage. Moreover, the result, in all likelihood, would be to create fresh hemorrhage.

No treatment can obviate the results of direct compression of cerebral vessels by a clot in the interior of the brain. We can only try to prevent increase of the pressure which already exists.

Asphyxia, due to mechanical obstruction of respiration, may be combated by drawing forward the tongue and chin, and placing the patient on his side, so that secretion may trickle out of the mouth instead of passing down the trachea. He should lie on the paralyzed rather than on the non-paralyzed side, in order to allow the latter some scope for action. When the bronchi are becoming choked with mucus, injection of atropine may check the secretion. Atropine, moreover, may be useful in stimulating the respiratory center and in lowering arterial tension.

Venous Depletion, Indirect and Direct.—Purgation by calomel or croton oil answers the purpose of indirect depletion, and may in clear cases of cerebral hemorrhage be recommended. Venesection fell into disrepute in apoplexy because it was carried to excess and used indiscriminately for all cases of unconsciousness, whether due to hemorrhage, occlusion of cerebral vessels, or simple syncope. The indications for venesection are, however, fairly clear, and if correctly observed it is difficult to believe that abstraction of a few ounces of venous blood can be otherwise than beneficial in cases of cerebral hemorrhage in the second stage. The condition which venesection may relieve is venous congestion of the brain, intensified by obstruction of exit of the blood from the right heart, such obstruction being the result of asphyxia.

When the left heart labors in vain to overcome resistance afforded by high arterial tension in front, backward pressure is induced in the right heart, which becomes engorged and unable to empty itself. Backward pressure spreads to the jugular and thence to the cerebral veins, a condition which aggravates pressure already produced by the intracerebral clot. The condition can only be rationally treated by temporarily aiding the right heart, and reducing the intravenous cerebral pressure by tapping a vein.

The condition which warrants venesection is manifested by a full, tense pulse, a laboring heart, with failure and acute distention of the right auricle and ventricle, and engorgement of the cervical veins. Venesection is contraindicated by a weak, small, fluttering pulse, with failure of a chronically (not acutely) dilated heart in debilitated, aged subjects.

ARTERIAL SCLEROSIS.

In an article on this important subject in the *British Medical Journal* of January 12, 1907, HERRINGHAM in speaking of treatment says that our business is to act upon some plan which will give the most hope for treatment. We cannot expect to remove disease already fixed permanently in the arteries. We can with some hopefulness attack a floating impurity in the blood. It is on this side that the chances of treatment are best.

Of course, if symptoms are severe, the first necessity is rest in bed, and under it alone a good many cases improve. Muscular effort produces for the time great rise of pressure, and complete muscular rest removes these moments of strain and gives the heart a chance to recover its tone.

But the author has chosen a slight case for his example, and chiefly on this account—that in such a case the last stage has not been reached, and that we can not only remove the symptoms for the time, but to a great extent prevent their increase and recurrence.

Such a patient will not be in bed, and will not be greatly benefited by going there. We can, however, do him a great deal of good by drugs, by diet, and by regulation of his habits.

It is highly important that such a man should take a certain amount of regular exercise daily; for though exercise, if severe, strains the heart, it is, when moderate, the best possible means of insuring a healthy metabolism. The author has suggested that this may be through the chemical activity of the muscles themselves. That is only a suggestion—nothing more. The effect may be due to other causes; but of its reality there cannot be doubt at all.

The second point is early rising, but the author states he cannot give any other reason why this should do good than that perhaps it promotes metabolism by giving opportunity for a little exercise before any large meal has been taken.

And a third is the renunciation of tobacco. The power of a pipe of tobacco in raising the pressure in man is as certain as is the result of its injection in animals. And though we cannot suppose that smoking produces such extreme changes in the arteries as do the strong injections used in animal experiments, the results of these must weigh greatly with us in treatment.

In some cases severe symptoms are for the time greatly relieved by nitrites; but their effect is usually transient. Still the author has known men made much more comfortable by small doses of nitroglycerin given for a week or two. For a more permanent effect small doses of potassium iodide have been highly recommended.

The author believes that no drug approaches calomel. Given in small doses of 1 grain or ½ grain every night for a short time and repeated at intervals, it sometimes is of very great use. It is not its purgative effect that is needed; it is really what is called an alterative. Every one appreciates its effects on the spirits, and the author believes this to be chiefly an effect on the blood-pressure, for it is known that melancholy is a state in which the pressure is high. [With this we cannot agree. The reverse is the case.—ED.]

Alkalies act chiefly by increasing the flow of urine, and this, especially in cases complicated by nephritis, is often of great importance.

He thinks that diet is perhaps even more important than either habits or drugs. He has not any doubt that in some cases a very light diet acts like a charm, of which he gives an example.

A man of over fifty, very thin and spare, was complaining of severe dyspnea and oppression, and had been in bed for some time at home without benefit. He could not lie down. There was no disease of his lungs, no edema, no dilatation of the right side of his heart, and no albuminuria. The author is not prepared to say his kidneys were healthy; probably they were fibrous. But the main thing about him was extreme degeneration of his radial artery and a very high blood-pressure. He was put on a hospital milk diet, and from that moment improved rapidly. He went out, resumed his usual food, and in three weeks his symptoms returned. This time the author made him go on milk diet at his own home, and the result was as good as before.

This effect, however, does not always follow. Almost at the same time the writer tried this diet on a rather older man with the same symptoms without producing any effect on his blood-pressure. He improved slowly, just as such cases usually improve when they lie up.

Whereas in the first case it seemed that the alteration in diet really removed to a great extent the cause of high pressure, which was, therefore, probably a floating impurity, in the second case it is reasonable to suppose that the pressure was due to some permanent changes in the vessels. Under such circumstances the high pressure is necessary for the blood flow, and all we can do is by rest and small doses of digitalis to strengthen the heart for its task.

The author does not quite know how, when this treatment succeeds, the effect is produced. It is not the necessary result of milk, for if milk alone is given, which involves drinking five pints daily, it is said to increase the blood-pressure rather than

diminish it. The milk diet which the author employs, however, contains milk (2 pints), bread and butter, rice or custard pudding, and tea (1 pint). There are about 70 grammes of proteid in it. The reduction of blood-pressure, therefore, might be due either to the reduction of proteid or to the alteration of the kind of proteid taken.

In some cases the author thinks the first is certainly the most important. In chronic nephritis, which always means diffuse nephritis—for interstitial nephritis is a latent disease—it used to be the custom to prohibit meat. Hale White and von Noorden have written against this treatment, and the author fully agrees with them. Such patients do much better with meat than without it, but the total of their food must be kept at a very moderate level, because their means of disposal of refuse are crippled.

But we must not expect to reduce pressure in them; in later stages, at any rate, it does not fall, even when, owing to uremic vomiting, scarcely any food is taken. This obstinacy may perhaps be due to disease of the abdominal arteries. It is known that these vessels have a preponderant influence on blood-pressure, and also that they are nearly always diseased in chronic nephritis of middle life. But it seems more probable that, as experiment suggests, the degenerating renal tissue pours a toxin into the blood which no change of diet could remove. In such cases the one important thing is to drain the poison off by increasing the flow of urine.

In other cases, however, he thinks it possible to deny that the kind of proteid taken is of importance. He is not at all a faddist about food, and does not share the belief that meat invariably floods our tissues with uric acid, and he thinks that many people are the better for a little wine. But his observation leads him to think that there is a great variety in the metabolism of different persons, and that the diet which is good for one is, quite apart from gastric indigestion, poison for another. There is exaggeration in this as in all things, and it is not often that a patient's observation of his own symptoms can be accepted without reserve. Still, it is the author's belief that chemical analysis has much further to go than the mere estimation of calories, or of the nitrogenous contents of the ingesta and excreta, and that our own observations if carefully made will often tell us more than chemistry can yet explain. Chronic rheumatism, some forms of headache, and high blood-pressure appear to the author to be clues of special importance in examining the effects of different forms of proteid, and he thinks there is a great deal to be done by following them up.

The writer does not ascribe the same importance to carbohydrates. They have great influence on digestion. Some people cannot eat bread or potatoes, some can eat raw sugar but not cooked sugar, and so on; but he has not observed that they affect blood-pressure.

He says the same of minerals. Salt has a certain connection with edema, but this is not through blood-pressure. Calcium he never saw have any effect at all.

This, however, may be from want of observation on his part, for he sees that others think differently.

Meanwhile there is one lesson that middle age has always to learn, and that is that it must be moderate, and that moderation means something very different from the ordinary meals of healthy and active youth.

ON WHITE-WINE WHEY IN INFANT FEEDING.

MYERS and STILL, in the *Lancet* of January 12, 1907, remind us that among the many foods which are occasionally of value in infant feeding sherry whey, or "white-wine whey," as it is sometimes called, must hold a high place, not because it has any particularly large nutritive value but because it combines certain properties which are of great importance under certain conditions. Like the ordinary whey prepared with rennet, the whey

made with sherry is easily digestible owing to the removal of the milk-curd in the process of preparation; and, like the rennet whey, it has also lost a large proportion of the milk-fat owing to its entanglement in the curd which was strained off. The curd, however, from sherry whey is flocculent, and thus unlike the curd *en bloc* produced by rennet; the fat also for this reason is less completely entangled, and the proportion remaining in the sherry whey is as high as that in a rennet whey, in which special precaution has been taken to liberate the fat so far as possible by breaking up the curd before straining. Their own analysis of sherry whey, prepared as will be described below, showed proteid 0.45 per cent, consisting almost entirely of the easily digested lactalbumin, fat 0.95 per cent, and there is also present (but not estimated by the authors) sugar about 5 per cent. The sherry whey therefore is, like rennet whey, a food low in nutritive value, but such as might be expected to agree well where there is difficulty in digesting the stronger preparations of milk. But sherry whey has other properties which do not belong to the ordinary rennet whey. The sherry which is used in its preparation gives to the white-wine whey its peculiar flavor, which is said to be due to the presence of essential oils or volatile ethers in the wine, constituents which probably contribute to the carminative effect, which is one of the virtues of this food.

Sherry whey has also a markedly acid reaction, and it would seem from the good results of buttermilk and of other preparations in which lactic acid fermentation has been artificially introduced in milk that acidity of the food, so far from being harmful, is sometimes beneficial in infant feeding. Sherry owes its acidity chiefly to tartaric and acetic acid, and its curdling action upon milk is due to this acidity. Sherries, however, vary in their acidity, and it is a matter of common knowledge that a "drinking sherry" curdles milk much less readily than does a "cooking sherry." They found, indeed, that from three to four ounces of drinking sherry was required to curdle half a pint of milk, which was readily curdled by two and a half ounces of cooking sherry. This is a point of some practical importance, for as will be shown, the proportion of alcohol in sherry whey made with the cooking sherry is quite as high as is convenient, and it is not desirable, therefore, to use drinking sherry, which not only contains more alcohol but must be used in larger quantity. Actual estimation showed the difference in acidity to be as follows:

	Fixed acid (estimated as tartaric).	Volatile acid (estimated as acetic).
Drinking sherry (2s. 1d. per bottle)	0.348 per cent.	0.027 per cent.
Cooking sherry (1s. per bottle)	0.352 per cent.	0.081 per cent.

Sherry whey, prepared as described below with this cooking sherry, showed fixed acid (tartaric) 0.067 per cent, and volatile acid (acetic) 0.015 per cent. More important, however, than the acidity is the alcohol, which gives to this food its stimulant effect, and some observations have been made to determine the exact amount of alcohol present. It might be conjectured from the mode of preparation that part of the alcohol contained in the sherry would be lost by the volatilization during the heating of the food, but as to the amount so lost and the amount remaining in the whey no information could be found in any text-book.

The method of preparation which after experiment the authors fixed upon as the most satisfactory is this: Ten ounces of milk was heated until just boiling, then two and a half ounces of cooking sherry was added and heat was applied again until the mixture began actually to "boil up," when it was removed from the fire and allowed to stand three minutes; the curd was then strained off through a twofold layer of butter muslin. The alcohol in this whey was estimated by the usual method of distillation and determination of the specific gravity in the distillate. Estimation was also made of the alcohol present in the sherry used in each case. Drinking sherry (2s. 1d. per bottle) was found

to contain 16.46 per cent of alcohol by weight. Whey prepared with this (three ounces of sherry was necessary, as no smaller amount would curdle) contained as nearly as possible 2.6 per cent of alcohol by weight; and as the dilution of the sherry by the milk would make the percentage 3.33, it is seen that 0.73 per cent of alcohol was lost in the preparation. A cooking sherrry, costing 1s. per bottle, contained 14 per cent of alcohol by weight; whey made therewith (using two and a half ounces as described) contained 2.28 per cent of alcohol by weight. The dilution of the sherry by the milk in this case would have made the proportion of alcohol 2.8 per cent; in this case, therefore, 0.52 per cent of alcohol was lost in the preparation of the whey. Another cooking sherry, costing 1s. 3d. per bottle, was found to contain 14 per cent of alcohol by weight; whey made with two and a half ounces of this sherry to half a pint of milk showed 2.28 per cent of alcohol by weight in one experiment and 2.3 per cent in another. Here, again, the loss of alcohol in the preparation of the whey amounted approximately to 0.5 per cent.

For clinical purposes brandy is a convenient standard of comparison in considering the alcoholic value of this food. An average brandy contains 42.5 per cent of alcohol by weight, so that if sherry whey be reckoned as containing 2.3 per cent of alcohol by weight, it is approximately one-eighteenth (strictly 1/18.4) of the strength of brandy, and one ounce of sherry whey is therefore, so far as alcohol is concerned, equivalent to 25.8 minims of brandy. In the use of sherry whey, therefore, it must be remembered that it is a food which contains a considerable quantity of alcohol.

The conditions in which this food is suitable for an infant are those in which only small quantities of food can be tolerated, and where a stimulant is necessary. Where there has been much vomiting, with or without diarrhea, and the infant has already been fed for some hours with albumen water or veal broth in small quantities, sherry whey often makes a useful step toward the return to milk feeding; sometimes, indeed, in the acute stage, where there is still much vomiting, a drachm, or a few drachms, of this food will be retained in the stomach when other foods have been tried in vain. In cases in which owing to difficulty of milk digestion there has been chronic vomiting and the infant has become feeble and exhausted, feeding for two or three days on small feeds of sherry whey alone, and then on alternate feeds of sherry whey and fully peptonized milk, is sometimes of great benefit. In the common cases in which food after food has been tried and the infant has become emaciated and screams with flatulence and colic after meals, sherry whey sometimes has a striking effect in reducing the flatulence and colic, and so relieving the child's distress; in such cases it may be given at alternate feeds for several days and then two or three times a day. The authors have seen excellent results from it also in the case of premature or very feeble newly-born infants.

The quantity of sherry whey which can be given is limited chiefly by the proportion of alcohol which it contains. It is not intended for prolonged use, but the authors have often used it as the only food for a week or ten days, and when it is given at alternate feeds only it can be continued if necessary for two or three weeks. To an infant six weeks old a tablespoonful can be given every half-hour or every three-quarters of an hour, and the amount and interval gradually increased until two ounces are taken every two hours. The quantity, however, as a rule is determined less by the age of the infant than by the general condition and the degree of tolerance shown by the stomach. At any period of infancy it is seldom desirable to exceed from two to two and a half ounces of sherry whey at a feed; but in exceptional cases the writers have given as much as three ounces every three hours to infants about six months old, and even four ounces every three hours to an infant twelve months old, for two or three

days with great benefit. As a general rule it should certainly be laid down that sherry whey, like any other fluid which contains alcohol, should never be given to infants in larger quantity or continued for a longer period than the exigencies of the case require.

AMYL NITRITE IN HEMOPTYSIS.

GRACE-CALVERT in the *Lancet* of April 6, 1907, asserts that the drug which seems to be most valuable in practically all cases of hemoptysis is nitrite of amyl. At first sight it appears to be madness to give a patient with a wounded and bleeding vessel a drug which acts powerfully as a dilator of vessels, but, even though its action be only transient, it produces such an immediate fall in the general blood-pressure by dilatation of the vessels throughout the body that the pressure at the bleeding point is lowered and there is time for clotting to take place, and the hemoptysis usually ceases almost instantly. Even if the pulmonary vessels are dilated the ill effects are more than counterbalanced by the fall in blood-pressure, but Dr. Francis W. E. Hare (who first suggested the use of nitrite of amyl) quotes in an article in the first number of the *British Journal of Tuberculosis* experiments which seem to prove that it has a direct vasoconstrictor action on the vessels of the pulmonary periphery in spite of a vasodilator action elsewhere. It may, however, be urged that this constriction of the pulmonary vessels is bad in that it must raise the blood-pressure in those vessels, but this seems to be more than counterbalanced by the fall in general pressure, whereas in the case of adrenalin, ergot, etc., there is no corresponding fall in general pressure. Moreover, nitrite of amyl causes no reactional pulmonary hyperemia (after the anemia), while adrenalin apparently does, for the writer mentions a cyst being removed by a "bloodless" operation under cocaine and adrenalin, and next day a large clot of blood being found in the place which the cyst had occupied. Again, nitrite of amyl has a further good point, and that is the fact that it does not interfere with coughing, and so does not place any obstacle in the way of the patient getting rid of the effused blood; hence it considerably lessens the risk of septic trouble later.

It is the custom of the writer to always carry three-minim capsules of amyl nitrite, and as soon as he is called to a case of hemoptysis he breaks one and tells the patient to inhale it quietly and regularly, and at the same time warns him of the feeling of fulness in the head it produces, as he found this feeling had alarmed one or two patients. The bleeding usually stops almost at once, though the patient may go on coughing up clotted blood which has already been effused. After that, if the patient is excited or alarmed, or the lungs appear to be irritable, he may give a hypodermic of morphine. From his experience of its action, however, he believes that in nitrite of amyl we have the best drug to administer first in any case of hemorrhage.

The following are brief notes of cases which have been treated with nitrite of amyl and may be of interest:

CASE I.—A youth, aged nineteen years, with most of the right lung consolidated, without any cavities, had a slight hemoptysis (about half an ounce) one evening. It ceased for the time being after inhaling three minims of nitrite of amyl, though for the next three days he brought up blood-stained sputum.

CASE II.—This patient had advanced mischief in both lungs and had many hemorrhages at various times. On March 1 he had a small, sharp hemorrhage, which was followed during the next few days by several small attacks, all of which promptly yielded to inhalations of nitrite of amyl. He was placed on liquor calcii chloridi, and the blood gradually disappeared from his sputum. On May 8 he had another short hemorrhage which yielded at once to amyl nitrite, though he continued to bring up bright-colored sputum for a couple of days, apparently from a recently

formed cavity. On the 17th he brought up three-quarters of a pint of blood, and this attack stopped after inhaling the contents of two capsules of amyl nitrite and morphine (quarter of a grain). On the next day at 5 P.M. he brought up two or three mouthfuls of bright blood, which ceased after an inhalation. On the next day (May 19) he started a profuse hemorrhage, and at once inhaled the contents of a capsule, and was then given another by the nurse. When the writer arrived a minute or two later he appeared to be dying, though the bleeding had apparently ceased. His heart was beating irregularly and feebly, and his pulse was scarcely perceptible. A quarter of a grain of morphine revived him and he vomited a quantity of blood, which with what he had coughed up made two pints. There was no further hemorrhage, but he died ten days later. In this case the writer is convinced that the nitrite of amyl saved him from immediate death on several occasions.

CASE III.—This patient had a cirrhosed left lung of several years' standing, active mischief throughout the right lung, and a dilated, irregular heart. He had seven attacks of hemoptysis during three days (several being fairly sharp), and all yielded more or less promptly to inhalations of amyl nitrite. He died a day later from sudden heart failure.

CASE IV.—This patient had tuberculous mischief throughout the left lung and had three attacks of hemoptysis. The first stopped at once with one inhalation, but the next two did not yield so promptly, perhaps because he did not have sufficient nitrite, as he did not have the feeling of fulness in the head to the same extent as on the first occasion.

CASE V.—This patient—a nervous, excitable man—had several attacks of hemoptysis at intervals of a few days which were all fairly promptly checked by inhalations of nitrite of amyl, though he sometimes continued to bring up brightly colored sputum for a short time afterward.

In all there are about 22 attacks of hemoptysis occurring in five patients, and in the whole of them the bleeding ceased at once or was remarkably diminished directly after the administration of the nitrite of amyl, so that it seems impossible not to ascribe the good effects to this drug.

WHERE TO SEND CONSUMPTIVES.

COBB writes on this practical theme in the *New York Medical Journal* of January 5, 1907. He thinks the hardest case for the physician to decide is the patient who is neither well-to-do nor poor, but who is anxious to sacrifice everything to get well. It is not always easy to know where to send such a person to obtain proper attention. If he goes uninstructed, for example, to Denver, or to Phœnix, or Los Angeles, there is every likelihood that he will fall among thieves, and if he has but a moderate amount of money his story will run rapidly to a close. From one quack to another he drags his utterly weary legs, the disease creeping upon him in spite of the never-ceasing sunshine. Then the lack of funds begins to pinch; if he has been fortunate enough to secure a position he loses it, even boarding-houses turn him from their doors. Down the rapids of despair rushes his frail bark, and the man who thoughtlessly sent him to the West is responsible for the disastrous outcome. It would have been better for such a patient to have stayed at home.

And even though the patient has plenty of money and comes West, it is not easy for him to obtain the kind of attention best suitable to his case, unless he goes to a good sanatorium. The average consumptive and his friends will not admit that he has the disease, and they nearly always try to delude themselves, and others, that he is only "threatened," or has "weak lungs." To suggest that the patient go to a sanatorium usually brings trouble for the physician, for the patient foolishly believes that to go to such an institution is to proclaim the nature of his

disease. The only thing to which he will consent is to go West, but as a rule such a person is never satisfied, and it is first this altitude and that, his gaze ever westward. On he moves from one town to another, while the *tache* of the great white plague deepens upon his prominent cheek-bones, and his rasping voice harshens to a croak. He little knows the tragedy written in his face as he turns from the unwelcoming stare of one boarding-house keeper to another. Hotels and boarding-houses do not want the consumptive, whether rich or poor.

Now if the physician had but insisted that there be no concealment of his trouble and had placed the patient in good hands at the start there would have been at least seventy-five chances that he would have recovered. So by all means try and persuade your patient to go first to a sanatorium, or at least arrange that he be under the direct supervision of a skilled specialist who will attend to the proper details for his care. Many patients go out West and promptly lose their lives, or all chance for recovery, because they have not been taught how to care for themselves. There is everything in right living for the consumptive, and he can only learn the details of this new life under the guidance of a specialist. All scientific means to arrest the disease should be exerted early, but if the patient has not the money to secure everything needed, then by all means keep him at home, where, if he must die, he will be among friends and relatives.

However, if after careful deliberation the decision is reached to send the patient to the West, explain all the conditions, as to length of stay, expense, etc.; then fix upon the place. There is a very foolish idea widely prevalent that if the consumptive is a young man he should be sent on a cattle ranch. Of all places the ranch is the worst for him. By all means beware of the ranch, for with thousands of cattle there will not be a drop of milk to drink; and the food and cooking! It is enough to say that the consumptive has no business there, for it requires a rawhide constitution to keep pace with the roving cowboy. And, too, don't send your case to a small town unless you know just what is there, for the accommodations and food are about on a par with the ranch. Send the patient to some well-known place like Denver, Colorado Springs, El Paso, Albuquerque, Phœnix, Tucson, or Southern California. In and around the cities enumerated, and in the cities of Southern California, there are sanatoria and skilled specialists for the special care of these cases. But don't send your patient off to hunt them up; attend to all the details yourself before allowing him to start West.

We, as a people, have done less for the consumptive than any of the great modern powers, and the reason for it, partly, is that we have grown up with the fixed idea that such cases must go to the West and have a special climate to enable them to recover. It is this wrong idea which keeps back the local sanatorium movement in the large cities of the East, where hundreds of such institutions are needed to care for that large class unable to go off to special climates. Truly, climate is the least essential of the consumptive's necessities. And so, if there be the least doubt of your patient's ability to properly maintain himself in the West, then by all means keep him at home, for the West is already overwhelmed with poor consumptives, and the sad stories of their distress make one's heart sick. But if the patient has plenty of money and is set upon it, do not hesitate to send him West, and advise and urge him to stay until he is well. And before you send him there, disabuse his delusion that climate cure is some concrete, specific thing which grows upon the sage bush, or hangs temptingly upon the cacti, which he can reach out for and take unto himself in one deep, satisfying gulp. If he would make a satisfactory and permanent recovery impress upon him that his patience must be enduring, his faith supreme.

NEWS OF THE WAR ON TUBERCULOSIS.

Under this heading the *Journal of the Outdoor Life* for January, 1907, tells us that the Minnesota State Board of Health has sown broadcast a series of circulars relating to tuberculosis which promise to do a world of good. There are six circulars in the series.

The first is addressed to physicians. It urges the importance of keeping a careful record of all recognized or suspicious tuberculous cases both for the benefit of the physician and the aid of the sanitary authorities in the control of the disease. The use of the laboratory of the State Board of Health as an aid to diagnosis is also urged. The physicians are advised most earnestly to use every possible opportunity to impress upon the public the curability of the disease, and the absence of danger to others if it is properly cared for. The importance of establishing sanatoriums for the care of early cases, and hospitals for the care of advanced cases, is dwelt upon at length, and the importance of the organization and work of antituberculous societies is emphasized.

Circular number two is addressed to the patient, whose aid in the suppression of tuberculosis in Minnesota is sought. This circular sets forth the causes of consumption, and the channels through which it is contracted. The circular states that a well person may safely live with a consumptive if the sputum of the consumptive is properly destroyed by burning and other precautions taken, and minute instructions are given as to the use of sputum cups and receptacles. Patients are told they should wash their hands frequently with soap and water, and if they have anything to do with the cooking and preparation of food they should take especial care to keep their hands clean. Men with consumption are urged in this circular not to wear beards or mustaches. Patients are told to sleep alone, and, if possible, in a separate room, which should always have an abundance of fresh air. Windows should be open day and night, and their soiled, washable clothing and bed linen should be handled as little as possible when dry and should be placed in water until ready for washing.

The general rule is laid down that the three essentials for the treatment of tuberculosis are fresh air, rest, and proper food. The following table of rules is included in the circular:

Don't spend your money for so-called consumption cures.

You can be cured if you begin the treatment of your disease early enough.

If you are a consumptive the cure is largely in your own hands. Be governed by the following suggestions:

Don't live in rooms where there is no fresh air.

Don't work in rooms where there is no fresh air.

Don't sleep in rooms where there is no fresh air.

Stay out-of-doors all you can.

Don't be afraid of cold air.

Remember that sunshine kills the germs of consumption.

Go to bed early. Sleep at least eight hours.

If you have to work, rest all you can while at home.

Don't worry. Worrying is not resting.

Eat all the good, plain, nourishing food that you can.

Raw eggs and milk are important articles of diet.

Drink plenty of pure water.

Don't drink beer, whisky, or other alcoholics.

Your most important duty is to get well. Let all other duties be secondary to this.

HIGH ALTITUDES IN THE TREATMENT OF NERVOUS DISEASE.

A variety of observations have been made on the subject of high altitudes in the treatment of nervous disease, including those of Erb, who wrote on "Winter Cures at High Altitudes," but few statistics have been forthcoming as to their value. Most of the Alpine stations with

an altitude over 1300 meters, such as Arosa, Davos, Leysin, and Montana, derive the majority of their patients from sufferers with tuberculosis of the lungs, while St. Moritz receives also many sufferers from anemia, chlorosis, and nervous conditions.

Professor Nolda, of St. Moritz, has recently contributed to medical literature an article on the value of high altitudes in the treatment of certain nervous diseases. He has observed 3000 patients of various nationalities suffering from nervous diseases and visiting St. Moritz. Those of Jewish origin predominate, but Slavs, notably Poles, and Romance nationalities, especially French, are also numerous. The next in number are Americans and Hungarians, while the Germanic races appear in the following order: Germans, Danes, Scandinavians, and English. The great majority of his patients were sufferers from neurasthenia, of which there were over 2000 cases. In those of recent origin due to anxiety, mental overwork, or following infectious diseases, alcoholism, and other intoxications, and traumatism, lasting benefit is often derived from a stay of from four to eight weeks, but in older and more severe cases a stay of from four to six weeks in summer and a further stay in the winter are desirable. With regard to the effect of the high altitude on the individual symptoms, the headache and vertigo usually disappear within the first few days; the insomnia, however, often persists until the end of the period of acclimation, which is usually from six to twelve days, but sometimes sleeplessness may go on for two or three weeks, which Professor Nolda does not regard as a contraindication, but if the condition still persists after three weeks he sends such patients to lower levels. On the whole, he finds that 90 per cent of neurasthenia with insomnia sleep better at high altitudes. The hypochondria associated with the disease usually becomes much less or disappears, and Professor Nolda disagrees with the view of Kraft-Ebing, who regarded mental disturbances as a contraindication. Mild degrees of cardiac neurosis, he finds, derive benefit from a mountain cure, but cases with dilatation or with marked arteriosclerosis should not be sent. Patients with migraine usually entirely lose their attacks from the day of arrival. Other visitors showing marked improvement are those with slight degrees of hysteria, melancholia, and epilepsy. Professor Nolda also finds that cases of spasmodic asthma of nervous origin derive much benefit, no less than 70 per cent of them losing their attacks very shortly after arrival at St. Moritz, and in support of this he finds that the disease is absolutely unknown amongst the native-born inhabitants. It is a familiar fact that the Alpine resorts owe a great deal of their vogue among those whose ordinary occupations are strenuous and exacting to the clear, rarefied atmosphere and to the exhilarating effects of the meteorological conditions found there, and it might *a priori* be expected that in conditions of moderate neurasthenia, and the functional nervous, cardiac, and digestive derangements associated with it, such surroundings would be beneficial, but it should also be borne in mind that many such conditions are the result of overwork or overstimulation, and that therefore enforced rest under as favorable conditions as possible is the rational form of treatment. It would seem that high altitudes should be recommended in the first instance to mild cases, or, as an after-care, in more severe conditions.—*Lancet*, April 6, 1907.

THE TREATMENT OF DIPHTHERIA.

CROOKSHANK in the *West London Medical Journal* for April, 1907, in speaking of this subject says that the dose of antitoxin should have no relation, as ordinarily understood, to the age of the patient. It should be determined by the view taken of the severity of the disease, and therefore, other things being equal, the younger the patient as a rule the greater the dose required. The accuracy of the view of the severity of the disease varies, of course,

with experience, but it involves, as has been said, recognition of the patient's age and of the duration of the illness. It is a good rule, in practice, to be guided by the extent of the area covered by membrane, unless the disease be laryngeal, when the criterion is the degree of mechanical obstruction.

An initial dose of 6000 units is a fair one to inject in a mild case of faucial diphtheria on the second day; 9000 or 12,000 units should be given at once on the third day if there be a moderate amount of membrane present; and if, for example, the tonsils, uvula, and soft palate be covered, 24,000 or 30,000 may be given at once on the fourth day.

Indications for the repetition of the injection are best gleaned from watching the membrane. If at the end of six hours the patient is not so well more antitoxin should be given; if in twelve hours the membrane has extended, more again, and freely, and yet again, until there are definite signs that it is shrinking and loosening. If in twelve hours or less after the first injection the membrane be loosening, a second dose may not be needed. A very real difficulty is, however, to decide what to do in those cases seen late, in which the membrane is already decaying and the patient profoundly toxemic. If there be not very grave toxemia the author advocates large doses until the membrane disappears; but he cannot be persuaded that on the sixth day, with marked toxemia, serum does any good at all. Still, one would not willingly withhold the slightest chance of doing good.

In hemorrhagic cases antistreptococcic serum fails, but in some other cases the polyvalent sera at least are of service, in the opinion of the author. Everything, however, has not been done when antitoxin has been given. Local treatment may not be thought necessary in the mildest cases; it may do harm to resistive patients, and at other times may not be so valuable as absolute rest. Still, the local application of antiseptics does reduce the length of time during which Klebs-Loeffler baccilli may persist on the mucous membrane even after the massive injection of antitoxin.

As a rule the author prefers spraying to either swabbing or syringing.

In fetid cases the "gargarisma chlorinata" may be used as a spray, or if the patient is old enough, as a gargle. Every four hours is, as a rule, often enough to spray the throat and nose, but the mouth and teeth cannot be kept too clean. If the pharyngeal tonsil be affected a siphon nasal douche may be used twice a day with benefit.

Much diversity of opinion has been expressed on the merits in diphtheria of medicine from a bottle, and many physicians now condemn the time-honored administration of iron, during the acute stage at least. Personally the author has, and had before antitoxin was introduced, the greatest faith in the value of perchlorides of iron and mercury, and still gives them in every case, with the addition of a little strychnine, in glycerin and water. If, however, the perchloride mixture disagrees, or causes ever so little heaving and retching, it must be discontinued, and the strychnine alone given either by mouth or by syringe.

Aperients are better withheld, at first, at any rate, and it usually suffices for the bowels to be relieved during the first fortnight by simple enema, once in every forty-eight hours. Two or three grains of gray powder, however, placed on the tongue at the beginning of the illness does good.

"Support" is necessary; even the bacteriologists admit that, in suggesting the natural mechanism of immunity to be bound up with that of nutrition, and it is worth remembering that we probably require certain foods, in what some physiologists would deem excess, for the elaboration of the highly complex "molecules" which Ehrlich calls receptors and immune bodies. But overfeeding may set up vomiting at first, or gastric dilatation later. As a rule, two-hourly feeds by day and three-hourly meals by night are suffi-

cient, and for children, in routine practice, nothing but what will pass through a feeder should be given at first.

Milk, if it can be procured fresh and unsterilized, may be given raw as a junket, otherwise it is best peptonized, pancreatinized, or mixed with a malted preparation. Fresh broths are good; so are isinglass, gelatin, and raw eggs. Meat juices and essences out of bottles and tins should be shunned, especially if the urine be scanty, when they may do great harm. The author believes it possible that the raw proteids of milk, eggs, and oysters should assist in the formation of receptors and immune bodies, but he cannot believe that potted products do. Old-fashioned beef tea is often a better cardiac stimulant than the most cunningly devised saline solution.

Most physicians still agree that brandy is of value in emergencies, but there seems a general consensus of opinion that its heroic administration in despair is of little good. As a matter of fact, it may do positive harm, and be the last factor in inducing complete anuria and the toxemia of retention. But in cases likely to be bad, small though frequent doses of grape brandy are invaluable. They should be given steadily from the time the temperature first shows signs of depression. The free administration of pure water is necessary, and fresh lemonade, taken warm, is acceptable to most patients.

CARBOLIC ACID.

WATKINS says in the *Eclectic Medical Journal* for May, 1907, that carbolic acid, not being the exclusive product of any chemical manufactory, nor a specialty of a proprietary firm, has not received the extravagant praises for its virtues that are conferred upon many antiseptics far inferior in effectiveness. Carbolic acid does not form a perfect solution with water; but this objection can be overcome by first combining the acid with glycerin, when the solution with water will be perfectly clear and transparent. The author frequently uses carbolic in the treatment of carbuncles, proceeding as follows: If the skin is not broken, an incision is made over the apex of the swelling. Peroxide is then applied until it no longer foams; now one end of a wooden toothpick is wrapped with a small portion of absorbent cotton, and, after dipping in undiluted c. p. carbolic acid, is thoroughly brought in contact with the interior of the carbuncle all around. A dressing is then put on and held in place with strips of adhesive plaster. The relief from pain following this treatment is remarkable, and there is scarcely any pain attending its application. The procedure should be repeated daily until recovery. After the first time the patient is quite willing, even anxious, for a repetition, because of the relief afforded.

This writer has found carbolic acid, full strength, applied to minor burns an excellent remedy for the relief of pain. The acid is brushed on lightly, and turns the surface a grayish-white, but gives ease at once. This should be followed by a dressing of oil or vaselin, and healing will occur without a scar. A mixture of carbolic acid one ounce and linseed oil one pint is always on hand in his office for application to the many "heats" which happen to the workmen in a machine shop near-by. In the more severe burns the grime and dirt are first removed from the burnt area and round about with coal oil or gasoline, and then the pure acid applied as above indicated. He has as yet seen no constitutional poisoning from absorption when using carbolic acid in this manner.

THE TREATMENT OF THE TYPHOID SPINE.

In the *New York Medical Journal* of April 20, 1907, GIBNEY states that the cautery as a counter-irritant has proved to be such a valuable instrument in his hands that he feels justified in recommending it above all other counter-irritants. The plaster-of-Paris jacket or corset has not proved so valuable an agent as has the simple Knight spinal brace or the

posterior spinal assistant of Taylor. The crisscross strapping with zinc oxide adhesive plaster has been a valuable adjunct, especially in the milder forms of this disease. Potassium iodide has been given in certain cases, but not with any definite results. Where deformity exists, as it undoubtedly does in certain instances, it is necessary to wear apparatus for longer periods. In view of a destructive process going on in the bodies of the vertebræ, the remarks made by McCrae in his conclusions, namely, the similarity of the process to that in arthritis deformans, are quite suggestive, and it may be well to call the attention of the profession to the value of immobilization in cases of arthritis deformans rather than the methods so commonly employed of massage, shampooing, electricity, etc., etc.

It is not intended to throw discredit on the work of a masseur or the various baths found throughout this country as well as those abroad, but it is intended to emphasize the importance of a clean-cut diagnosis by a careful examination of the parts, by interpretation of the pains in an honest endeavor to determine whether the pains are radiating and due to pressure on a nerve, or whether they are boring pains of surfaces rubbed together, and after having made a diagnosis adopt methods of treatment that may be regarded as rational. If one has an acutely inflamed surface, whether the result of trauma or an exudate or of the surgeon's knife, the first indication is to put the parts at rest and keep them at rest so long as the parts remain sensitive. In spinal lesions it is important to immobilize not only the parts involved but those contiguous thereto, above and below, and to get an accurate adjustment of the immobilizing apparatus. It is often necessary in these very acute cases to supplement this fixation by means of rubber adhesive plaster, crisscross strips, from an inch to two inches in width, and half encircling the body. It is true that patients frequently complain when the plaster is removed, but they do get so much relief after a pretty good adjustment of same that removal is tolerated, especially if the surgeon remind the patient that the removing of it makes a pretty good counter-irritant. It is important also to remember that the apparatus must be worn for months in the average case. Remembering, as we must, that the pains are often caused by trauma, one can readily understand how trauma will induce an exacerbation, and the object of the apparatus is to prevent trauma. A patient often feels so well that he takes liberties with the apparatus and discards it contrary to the advice of the surgeon. He hears so much about gymnastics and athletics and the wonderful skill of the masseur that he takes the case into his own hands, and often gets a relapse as a penalty.

The Paquelin cautery, in conclusion, is insisted upon as a regular line of treatment as long as tenderness and pain on movement exist. Even after all tenderness subsides it is a good plan to employ the cautery occasionally, say once a week or once in a fortnight. It has been shown that even these deformities and areas of infiltration, bony or muscular, disappear after a while, and fortified by this assurance the surgeon can decide when to begin the convalescing part of the treatment, namely, douches, hot baths, and systematic graded exercises, the object of which is to correct the stiffness developed in the muscles which have been for a time out of commission, and to restore the tone generally to the spinal column.

Nothing has been said thus far about anodynes and hypnotics. The histories of many of the cases now on record show that these are often necessary, even to the administration of chloroform. The writer does not recall any instances where the drug habit has been acquired. The administration, therefore, of hypnotics must be left to the individual practitioner with the suggestion that, if the aforesaid treatment by fixation and cauterization is carried out, hypnotics will not be in great demand.

THE TREATMENT OF CARDIAC DEGENERATION APART FROM VALVULAR DISEASE.

In the *American Journal of the Medical Sciences* for May, 1907, BABCOCK in speaking of this subject says that theoretically strophanthus is the drug which should yield the happiest results in these cases, and he has often been favorably impressed with its effects. Nevertheless no one cardiac tonic is equally suitable to all cases, and it is actual trial that must serve as the guide.

Formerly, from theoretical considerations, he was strongly opposed to the employment of aconite in cardiac disease. Experience has convinced him, however, of its great utility in some cases of myocardial degeneration characterized by great hypertrophy together with dilatation. In such cases tincture of aconite controls the uncomfortable sense of palpitation which annoys some patients. When, on the contrary, the heart chambers are greatly dilated and inadequate, this remedy is not beneficial, if indeed it be not positively harmful.

Cathartics form a class of medicinal agents which deserve special attention. Although capable of doing harm when pushed to the extreme for too long a time, they are employed too gingerly by most practitioners. Whenever the portal system is much engorged, cathartics are indispensable. Stasis within the great intra-abdominal vessels acts as a dam to the circulation. Under such circumstances the heart is obliged to propel the blood-stream against a barrier. To remove this hindrance we must either bleed or purge, and as frequent loss of blood by venesection would be disastrous we must administer cathartics.

These should be bland and unirritating, and a saline ordinarily the best. Sulphate of magnesium answers very well in many cases, but the author's preference is for some aperient water containing sulphate of sodium as well as magnesium. The correct principle of its employment is to administer the cathartic daily, because, in the first place, an individual with a degenerate myocardium should never be allowed to strain at stool, on account of his liability to dilate his ventricle, and in the second place, since the main reason of the cathartic is to keep down portal stasis, its action should be continuous, so to speak, or, in other words, daily and not at considerable intervals. The tendency to stasis is ever present, and if attacks upon it are spasmodic and unsystematic, as it were, the vessels will remain engorged or become more so in spite of us.

As long as pulse tension is high, as in the cases of cardiac inadequacy associated with chronic nephritis, the cathartic affords relief, because it removes intestinal toxins as well as lessens resistance in the great intra-abdominal vessels, and thus facilitates the work of the heart. When, on the contrary, blood-pressure has become low and dilatation is predominant the daily purge brings relief, because of its diminishing the ever-growing engorgement of the abdominal viscera. It is indispensable, therefore, in all cases of degeneration with consequent insufficiency of the myocardium.

Finally, a few words in regard to the use of morphine in this class of cases. Few therapeutic agents are of as positive value as is this, when properly administered. Its chief merit consists in its ability to relieve the attacks of dyspnea (cardiac asthma), which so often rob these cardiopaths of needed rest. Given in a small dose subcutaneously, 1/10 to 1/8 grain, late in the evening, morphine acts as an efficient heart stimulant and almost without exception will ward off the dyspnea. In many persons it also exerts a satisfactory hypnotic influence and brings the much-needed repose and refreshment. Were this the only service rendered by this remedy it would make the agent well-nigh indispensable. But when administered in a small daily dose and in the manner recommended, morphine becomes a positive tonic to the inadequate heart and contributes powerfully to restoration of potential strength and prolongs life when recovery is impossible.

In the majority of cases a dose larger than 1/8 grain is not necessary, and hence

the writer regards it as a mistake to begin with ¼ grain, as is so often done. It is his invariable rule to follow the morphine next morning with a cathartic containing sodium, and when the bowels are kept open by this means he has rarely seen intolerance of the drug. He has known cases in which ⅛ grain was administered hypodermically every evening for many weeks without the necessity of increasing the dose.

The writer has recently resorted to the hypodermic use of 1/12 to 1/6 grain of heroin for the relief of nocturnal dyspnea, and has seen it followed by almost miraculous relief when such had not been obtained by morphine. He has never observed the same results from the use of morphine or opium by the mouth as by subcutaneous injection. The objection that dependence upon morphine may become a fixed habit is of no weight in a case of incurable heart disease, which if restored to some degree of competence, yet cannot last for many years and oftentimes for not more than a few months.

THE TREATMENT OF COMPRESSED-AIR (CAISSON) ILLNESS.

PELTON states in the *American Journal of the Medical Sciences* for May, 1907, that he has found the following plan the best in the treatment of all types of compressed-air illness: The first consideration is recompression of the patient—that is to say, he must be subjected to the further influence of compressed air. For this purpose so-called hospital locks should be provided. Such a lock may consist of a horizontal cylinder made of one-half to three-quarter inch boiler iron; a very practical size is about twenty-five feet in length by seven feet in diameter. The lock should be divided into two chambers by a partition in which is an air-tight door opening outward. The open end of the lock should be fitted with a similar door. The double-chambered lock is the most practical type, for since both chambers are supplied with outlet and inlet valves, a means is thus afforded whereby the patient can be visited by an attendant without reducing the pressure to which the former is being subjected. Adjuncts which increase the efficiency of the lock are a couch, upon which the patient may lie; a telephone, by means of which he may communicate with the attendants outside; a clock, electric lights, and heating apparatus; the latter should be in the form of electric radiators, for steam radiators may possibly burst, a consequence which might produce most unpleasant effects.

Usually when the patient, if suffering merely from the mild type of the affection, and especially if he has applied for treatment soon after the onset of his symptoms, is subjected to recompression he experiences very striking relief, the pains disappearing entirely long before the height of the pressure in which he has been accustomed to work has been reached. The pressure is allowed to rise, even after relief is evident, to a height equal to that in which the patient has been working, and then he is "decompressed"—that is, the pressure is slowly lowered to normal at the rate of about one-half pound per minute. Even slower decompression may be advisable in severe cases. Valves are obtainable which so control the outlet of air that the time necessary for the outflow of a given amount is the same whether the pressure within the lock be high or low. It must not be forgotten that it is necessary to supply the lock with a certain amount of fresh air after the inlet valve has been closed, otherwise the patient would be in danger of suffocation.

In treating instances of compressed-air disease it is unwise to subject the patient to the maximum pressure for more than five or ten minutes. When relief is experienced from the pain of an ordinary attack of the "bends" the patient is directed to move about the lock and to exercise and rub the affected part with a counter-irritant ointment. In most of the mild cases the patient leaves the lock wholly relieved, but if there is a return of the

pain recompression is advisable, the pressure being allowed to ascend until the pain disappears, when slow decompression is instituted as before. A third or even a fourth recompression may be employed if necessary, but usually the relief experienced from these subsequent treatments is temporary and slight in character. It is wise, if there is still continuation of the pain after the patient has been sufficiently recompressed, to advise thorough rubbing of the painful part with a counter-irritant ointment or liniment. The following are suggested: Capsicum oleoresin 2 parts, oil of turpentine 5 parts, oil of rosemary 5 parts, camphor 5 parts, olive oil 5 parts, petrolatum sufficient to make 100 parts; or menthol 10 parts, methyl salicylate 5 parts, chloral hydrate 10 parts, lanolin to 100 parts. The faradic current, high frequency current, and vibratory massage may prove beneficial. Hot baths, hot-water bags, and the electrotherm are very helpful adjuncts. Ironing the painful part with a hot flat-iron, a flannel cloth being interposed between it and the skin, is also suggested.

The persistent pains may be relieved by analgesics, such as salipyrine 10 grains every two hours, acetanilide 5 grains every four hours, or acetphenetidin 10 grains every three hours. These drugs should be given with care, and if there is any tendency to heart weakness they should be combined with citrated caffeine. Codeine may also be prescribed. Rarely are the symptoms severe enough to warrant the employment of morphine. In the management of all forms of the condition other than that characterized by pain, little in the way of specific treatment aside from decompression can be done.

Much, however, can be accomplished in the more serious types by the employment of symptomatic measures; when cardiac or respiratory weakness is evident hypodermic stimulation with strychnine, adrenalin chloride, caffeine, etc., should be resorted to. Artificial respiration may be indicated, and stimulation, by means of enemas of hot coffee, is always advisable in comatose cases. All these measures may be applied by attendants while the patient is under pressure in the hospital lock. Sometimes the results attained, even in patients in coma, are surprisingly good. Oxygen may be administered if there is respiratory failure, but should not be given while the patient is under pressure.

The after-treatment consists in careful nursing, feeding with nourishing food, and the use of tonics. Patients affected with persistent paralysis should receive the routine treatment of the chronic stage of peripheral neuritis. If the patient is confined to bed the prophylaxis of bed-sores is an important consideration, and if catheterization is necessary it is needless to state that this procedure should be conducted with the most thorough asepsis. The paralyzed muscles will be benefited and the patient's general condition will be improved by the systematic employment of galvanic and faradic electricity, massage, passive movements, and appropriate hydrotherapeutic measures.

THE TREATMENT OF PERNICIOUS VOMITING OF PREGNANCY.

In the *American Journal of Obstetrics* for April, 1907, NORRIS points out the fact that while hoping that the investigations of the biological chemist will finally solve the mysteries of normal and abnormal metabolism, and thus make clear to us some of our cases of pernicious vomiting, we must continue to treat them largely empirically, and in order to introduce his topic for discussion he briefly reviews the methods he has found the most useful.

Drugs.—After lavage of the stomach, fractional doses of calomel, given at short intervals, are frequently retained, and when possible an effervescent saline may be added. When the stomach contents are exceedingly acid, lavage with weak solutions (gr. ij to f℥j) of sodium bicarbonate has been efficient. Of drugs that are to act directly upon the catarrhal condition

of the stomach, he has found none more useful than silver nitrate, always given in solution, gr. 1/6 in a glassful of water, and repeated at regular intervals of six hours. When the incessant vomiting has slightly improved, a capsule containing cocaine gr. 1/8, cerium oxalate gr. iij, bismuth subnitrate gr. v, at four-hour intervals, will be useful. Counter-irritation with mustard over the stomach and rectal injections every sixth hour containing 30 grains of bromide with 15 grains of chloral, to allay nervous irritability, reënforced with the hypodermic administration of morphine at night to secure sleep, complete the drug treatment. He believes the most valuable of any single means of treatment is the frequent lavage of the colon with warm salt solution, the patient being elevated in the Trendelenburg posture during the inflow and returned to the horizontal position for the outflow, a portion of the fluid being left in the bowel for absorption. Thirst is thus relieved, the tissues are supplied with abundant fluid, elimination of toxins is increased, and starvation is delayed. The tongue becomes moist and cleaner, the bowel is cleansed of the mucus so commonly present in the neurotic cases, and the kidneys secrete more urine.

Feeding.—It is as useless as it is usual to attempt the administration of food by the mouth, trying at definite intervals one after another of the predigested and proprietary foods. Immediately upon isolating the patient, preferably in a hospital, absolute rest from food by the mouth should be required. In cases that do not resent, or have become accustomed to lavage of the stomach, it is useful to have the patient awakened in the early morning, and after lavage deftly given by one who is skilled, predigested milk or egg water is given, and the patient left to sleep under the influence of the nerve sedatives or the morphine that had been administered at midnight. The author has had no experience with the dietetic treatment recommended by Kolpinski (*New York Medical Journal*, June 9, 1906), who, by heavy foods such as pork, bacon, or ham, with corn bread, cauliflower, kale, or turnips, aims to quiet the stomach by this ballast, which renders the contents of the stomach too heavy to be ejected. The author asserts he would not hesitate to try it in view of the success attained by it. Rectal feeding has been one's reliance in the past, but he is forced to believe that it has done great harm in the hands of those who have the greatest confidence in it, and who, relying upon it for too long a time, permit the patient to pass beyond the help of artificial abortion. It doubtless does delay somewhat the progress of starvation, but only to a small degree. Rectal feeding is dangerous in proportion to the confidence one places in it.

Treatment by Suggestion.—It is important in every case that the physician's attitude should be one of positive encouragement. Suggestive therapeutics is paramount in neurotic cases and valuable in any case. The mere description of an induced abortion, with its attendant dangers, has speedily put an end to hysterical vomiting. The most generally useful local treatment for its mental effect upon the patient is the introduction into the vagina of the rubber bag, which, by its distention, is an ever-present reminder of treatment directed to the pelvic organs. The mental impression produced by it is more lasting than an attempt at dilatation of the cervix.

Finally, when shall abortion be induced to save the patient's life? As stated above, there is no laboratory investigation by means of which we can determine with scientific accuracy the degree of starvation beyond which she should not go. There is, however, a group of clinical signs of starvation and toxemia which should not be permitted to appear. We recognize the disease when all food and drink are monotonously rejected; the smell or sight of food and change in posture provoke nausea; weakness and exhaustion keep the patient in her bed; thirst becomes intense; there is epigastric pain and tenderness,

and constipation; the tongue is dry, thickened, and beginning to be brown, and emaciation appears. Then come the final stages, when a "typhoid" state appears, with rapid, feeble pulse; the muscular heart sounds weaken; there are fever, restlessness, diminished urine with albumin and casts, and finally delirium, followed by stupor, coma, and death. Induction of abortion to avail must not be delayed until this typhoid condition appears: it must be resorted to in the earlier stage. When a patient is so ill with this disease that she cannot leave her bed, then, at least, is the time for hospital isolation and treatment, and if throughout a period of seven to ten days there is no improvement under carefully conducted treatment, if emaciation is progressive, and the urine examinations repeatedly made show increasingly high proportions of ammonia nitrogen, then it is plainly our duty to delay no longer. The method to be employed deserves a comment. Rapid dilatation of the cervix under anesthesia, especially chloroform, carries with it no little danger to well-advanced cases. For these cases the metranoikter is especially valuable. Slipped into the cervical canal, complete dilatation can be accomplished without an anesthetic, and subsequent thereto the uterus may be emptied rapidly under ethyl chloride or nitrous oxide anesthesia, if they are necessary, and a gauze pack placed in the uterus. Many cases have been lost after terminating pregnancy because the operation has been too long delayed. Some cases have been lost because this mysterious disease seems at times to be inherently fatal from the beginning, no matter what treatment is followed or how early abortion is induced.

EFFECTS OF ADRENALIN ON THE BLOOD-VESSELS.

C. B. MEYER (*Wiener Medicinische Presse*, 1907, p. 105) reports concerning some of the properties of the muscular coat of the artery with special reference to the action of adrenalin. He was able to determine, by experimenting with parts of carotids from oxen that had just been killed and which were suspended in a warm oxidated Ringer solution, that as little as 0.0001 mg. of adrenalin in 100 Cc. of solution contracted the muscular fibers of the vessels. Incidentally adrenalin is taken up by the arterial tissues, but may be removed again by washing. As a result of Meyer's investigation it is now possible to discover minute quantities of adrenalin, the presence of which cannot be determined by chemical means. Heretofore Ehrmann employed the enucleated bulbus of the frog, which reacts to minimal quantities of adrenalin (with enlargement of the pupil) for such physiological tests and estimates. The much-employed vasoconstrictor (and therefore blood-pressure-raising) action has a peripheral origin, probably in the nerves. Meyer has found a substance resembling adrenalin in the blood of animals. Consequently it seems that the adrenalin of the suprarenal gland affords a regulator of the caliber of the arterial system.

THE AFFECTIONS OF THE CONJUNCTIVA, DWELLING ESPECIALLY UPON THE DRAINAGE OF LACRIMAL CANALS FOR TREATMENT.

TIFFANY in the *Kansas City Medical Index-Lancet* states that for entropion the author has a treatment which is peculiarly his own, and it is that of cauterizing the margin of the lid with the electrocautery. With a knife electrode at white heat, he burns from near the punctum in a line to the canthus, parallel with the margin of the lid and about two or three millimeters distant from it. This incision embraces the integument down to the tarsal cartilage. He takes care not to go too near the margin of the lid, lest the intense heat destroy the hair follicles and lippitude follows as a result.

So in the case of ectropion, in a similar way he burns through the conjunctiva about two or three millimeters distant from the margin. The cicatrix formed from the incision in the first case draws

the margin of the lid with the lashes away from the eyeball, and in the second case it inverts the margin of the lid and draws it up to the eyeball.

In phlyctenular conjunctivitis as well as blepharitis, he has found the sufflation of calomel to be quite efficient. It seems to act as a germicide and so allays the inflammation. In phlyctenular troubles, both of the conjunctiva and cornea, it erodes the papule and thus evacuates the fluid, kills the germ and fills up the facets, covers and protects the nerve terminals, and so checks the photophobia. Instead of the mild chloride of mercury he often resorts to the yellow oxide with a little cocaine and adrenalin. His formula is as follows:

> Yellow oxide of mercury, 8 grains;
> Adrenalin, 1/8 grain;
> Cocaine, 2 grains;
> Vaselin, enough to make 1 ounce.

With the adrenalin added the salve acts as an exsanguinator, allowing the mercury to come more directly in contact with the germ and diseased parts. This ointment comes as near being a panacea for the different affections of the conjunctiva as any that the author knows of. But it must be carefully ground and mixed so as to be perfectly impalpable; otherwise it acts as an irritant. This salve, like good wine, improves with age. He does not use it when freshly made, but waits until it is a week or two old.

Three years ago, when attending the American Medical Association at Atlantic City, Dr. Miles Standish, of Boston, read a paper upon the use of argyrol in conjunctivitis, lauding it very highly as being superior to all other drugs in treating conjunctivitis, acute, subacute, purulent, or chronic. Whereas the author has found this drug to be a most excellent and reliable agent in the treatment of most cases of conjunctivitis, especially subacute or purulent, yet in some it has utterly failed to bring about the desired results, more especially in old chronic cases. In such cases he has had to resort to the old standby—nitrate of silver. Argyrol is preferable to silver nitrate in most cases; it is not only effectual, but it gives little or no pain, whereas the nitrate of silver is very painful unless mitigated by cocaine.

It has been his practice in using these drugs to apply also massage by means of a pledget of cotton saturated in a boracic solution, gently manipulated over the closed lids.

But more than all this the author wants to call our attention especially to the hygienic condition of the patient. There is great necessity for cleanliness, for good nutritious food, for proper clothing; attention to his diet and to the freedom of the system from all narcotics and stimulants.

THE ACTION OF WINE ON THE TYPHOID BACILLUS.

If a drinking-water is suspected of containing typhoid bacilli, is it a useful precaution to dilute it with wine before imbibing it? According to MM. Sabrazes and Marcandier the answer to this question must be unhesitatingly in the affirmative. They find that ordinary wine exercises a distinctly bactericidal effect upon the typhoid bacillus. If two drops of a typhoid culture is added to wine in a test-tube the bacilli are rapidly killed, and the same action takes place, though less quickly, when the bacilli are added to a mixture of wine and water. Incidentally, the corollary from these considerations would appear to be that those who are anxious to avoid contracting typhoid fever would be in the position of greatest security if they abstained from water altogether, and drank nothing but pure wine; but the authors do not press this point. They have investigated a variety of wines and find that these differ somewhat in their efficacy, the general rule being that white wines are more potent than red. Champagne appears to be the most valuable of them all, as it destroys the bacilli in less than ten minutes; then come other white wines, Sadirac and Cerons, which take some five or ten minutes longer. Of the red wines Beaune is one of the most

effective, taking something under thirty minutes to complete its bactericidal effect, whereas with some of the others from two to three hours are necessary. These experiments were made with wine unmixed with water. As examples of the delayed action produced by the addition of water, it is stated that when red *vin ordinaire* receives an addition of water up to dilutions of 1 in 2 or 2 in 3, the time requisite for the complete bactericidal action is extended from two to four hours; and with champagne containing equal parts of water the time is increased from ten minutes to one and a half hours. In actual practice, in order to feel quite secure that a suspected water has been freed from danger, the authors recommend that an equal quantity of wine be added several hours before consumption—six hours when white wine is used and twelve when red is employed.

All this, so far as it goes, seems good news for the bibulous fraternity. But the expectant alcoholist has a disappointment in store for him. MM. Sabrazes and Marcandier state that the proportion of alcohol, which in their test varied from 8 to 15 per cent, has scarcely any influence upon bactericidal action. The acidity of the wine is the property to which the destruction of the typhoid bacillus is mainly due. Thus, a white Sadirac which killed the bacilli in less than fifteen minutes, was found, after neutralization, to be capable of retaining living organisms for more than six and a half hours; and when equal parts of water were added the bacilli remained alive for several days. The hyperacidity of the white wines as compared with the red appears, in the cases investigated, to account for their superior bactericidal action. In addition to the numerous organic acids usually present in wine, white wines contain a variable amount of free sulphuric, and it is considered that their inimical action upon bacteria is especially favored by the presence of this substance. These observations suggest a ready, if not very palatable, method whereby the staunch teetotaler can disinfect his drinking-water without doing violence to his principles.—*Lancet,* June 1, 1907.

ADRENALIN AND COCAINE IN THE LARYNX.

G. Frey (*Wiener Medicinische Presse,* No. 10, 1907) reports in regard to the regional anesthetization of the larynx as follows: Regional or transmitted anesthesia—that is to say, the production of the anesthesia of the nerve-plexus through injections of cocaine in the immediate vicinity of the nerve-trunk—has been greatly facilitated by the combination of cocaine with adrenalin. The author has succeeded in rendering the mucous membrane of the larynx insensible by anesthetizing the superior laryngeal nerve. The needle is introduced in the middle, between the large cornus of the hyoid bone and the upper cornus of the thyroid cartilage (in a medium-sized neck), about 3 centimeters from the medium line and somewhat to the rear. For the injection the author employed a solution of 1 to 1½ per cent of cocaine in a sterilized physiological salt solution, to which adrenalin had been added. About one cubic centimeter of the fluid was injected on each side. The needle must not be introduced to the extent of more than one centimeter (in the case of obese persons to a somewhat greater extent), otherwise the point of the needle will enter the larynx through the membrana thyrohyoidea. Subsequent to the injection the patients experience a slight feeling of tension in the neck or a pungent sensation; sometimes the face becomes temporarily pallid, the frequency of the pulse is increased or a tremor of the hands is observed. The palate and pharynx must, of course, be cocainized separately. After five or ten minutes, and sometimes only after twenty minutes, there is a complete and generally very marked anesthesia of the laryngeal mucous membrane, which is maintained for fifteen minutes, and is often sufficient for practical purposes after forty minutes and is not replaced by the normal state for two or

three hours. In one instance a secondary operation for a polypus of the vocal cord could even be executed after six hours. The anesthesia extended from the upper portion of the epiglottis to the glottis—*i.e.*, the opening between the vocal cords; at the same time the mucous membrane of the larynx was rendered highly ischemic and remained in that condition as long as the anesthesia lasted. The method was employed for the removal of neoplasms, and for cauterization and curetting; it appears to be particularly indicated for the removal of foreign bodies from the larynx.

THE COMMON BACTERIAL INFECTIONS OF THE DIGESTIVE TRACT AND THE INTOXICATIONS ARISING THEREFROM.

When discussing this subject in the *Journal of the American Medical Association* of March 23, 1907, HERTER says concerning therapeutic considerations that the difficulties that beset our efforts to control and modify excessive intestinal putrefaction are obvious. Although the cases arrange themselves in groups, every one presents certain points of difference. Our experience is so incomplete that as yet our efforts are more or less experimental. Notwithstanding this, one may lay down rules for partial guidance that are based on certain principles, but a careful regard for individual traits is imperative.

The mild cases often show a rapid improvement and lose the evidences of putrefaction. The patient feels well, yet he can hardly be called normal, because he has deficient reserve power and will easily relapse to his former condition after an indiscretion in eating or excessive fatigue or worry. The long-standing cases improve slowly at best. The chemical products of putrefaction may be reduced in amount, but the symptoms often persist, and even under most favorable circumstances the patient is liable to frequent and protracted exacerbations.

The following principles must be regarded in treating all the three types of putrefaction: (1) Avoidance of continued reinfection that follows the ingestion of putrefactive bacteria with the food; (2) the promotion of prompt digestion and rapid absorption from the small intestine; (3) the reduction of the number of putrefactive anaerobes in the ileum and colon.

1. To avoid infection and reinfection the mouth must receive scrupulous care. Carious teeth and gingivitis must be treated carefully by the intelligent use of the tooth-brush and of washes containing peroxide of hydrogen. In conditions of gastric atony a process of putrefaction begins in the stomach that normally starts in the colon. Gastric fermentation and putrefaction are controlled by lavage every day, perhaps best in the morning. The reduction of the number of bacteria leads to lessened damage to the bowel at lower levels.

In the preparation of food ordinary cleanliness is very effective. It is probably better to use cooked food as much as possible. Fruit is not above suspicion, for Dr. Rettger has determined that the bacillus of malignant edema is commonly present on banana peel. This suggests the advisability of peeling all fruit that is eaten. Milk always contains a large number of bacteria and often some of the putrefactive forms, especially *B. putrificus*. The lactic-acid-formers abound, but their action is rather beneficial in that they antagonize other and harmful forms. Sterilization of the milk is of little value. Pasteurization or the ordinary boiling kills the lactic-acid-formers, but does not harm the spores of the putrefactive organisms. Cheese, except fresh, home-made cheese, contains many putrefactive forms, and is best avoided, particularly inasmuch as many of these patients lack the protective action of the normal amount of hydrochloric acid in the stomach.

2. With rapid digestion and prompt absorption little pabulum for the putrefactive organisms reaches the colon. These processes are facilitated by measures that improve the secretory and motor functions

of the stomach. Chief among these is proper mastication, which largely determines the ability of the body to utilize food. When large masses of meat are swallowed, they commonly appear in the feces. Comminution of food outside the body is not an adequate substitute, for the patient then loses the emotional stimulus to gastric secretion and also the digestive action of the saliva itself. The administration of hydrochloric acid often helps for a time, but in long-standing cases, especially those of the combined indolic and saccharobutyric types, it is of little use. Ferments, such as pepsin and pancreatin, are of doubtful value, although they cannot be said to be always useless. Diastase gives better results, as it enables the patient to utilize more extensively the carbohydrates of the food. If, as often happens, the stomach is irritable, it is advisable to give small meals and to administer flaxseed or other demulcent before eating. The best pancreatic stimuli, aside from the quality of the chyme, are cheerful emotional accompaniments of eating, and rest, physical, mental, and sexual. Prompt absorption is promoted by restricting the amount of food, especially of proteid food. Meat should rarely be eaten more than once a day.

3. To reduce the number of putrefactive organisms in the colon, one turns naturally to intestinal antiseptics. While these drugs may act efficiently on bacteria in the stomach, evidence of their continued action in the intestine is variable. Perhaps the salicylates are most likely to check fermentation and putrefaction in the stomach and small intestine. It is conceivable that certain oxidizing substances which are slowly dissociated, such as manganese dioxide, may reach the colon in time to liberate their oxygen there, and thus, in part at least, remove the anaerobic conditions that obtain in this part of the intestine.

The use of laxatives may be followed by temporary benefit, in that they lessen absorption from the gut, as is shown by a decrease of the ethereal sulphates in the urine, after their use. They must, however, be given with caution, lest they increase the irritability of the bowel and lead to diarrhea and loss of strength. On the whole they are useful in acute and subacute cases only.

There are certain very tempting methods which aim to substitute harmless bacteria for the putrefactive organisms, but more evidence is needed as to the value of this procedure. It is a common practice to introduce lactic-acid-formers in kumiss and kefir, and also in bacilac, a fermented milk introduced by Metchnikoff, which is free from yeast. Irrigation of the colon two or three times a week is often followed by a decrease of the ethereal sulphates in the urine and by relief from symptoms, including both the mental symptoms and the anemia. This procedure is more efficacious in the saccharobutyric and combined types of putrefaction.

THORACIC ANEURISM.

In the course of an article on this subject in the *British Medical Journal* of March 16, 1907, OLIVER says in regard to the treatment of thoracic aneurism that rest in bed and quietude are essential, accompanied by a restricted diet. Cases of thoracic aneurism unaccompanied by aortic incompetence are more amenable to treatment than those arising just above the aortic orifice and accompanied by aortic regurgitation, for in these there cannot be that calmness in the interior of the sac which is necessary for coagulation of the blood. The administration of iodide of potassium gives on the whole the best results. Pain and paroxysmal dyspnea are frequently relieved by it. The author has administered to some of his patients as much as 450 grains of potassium iodide per diem, but there is nothing to be gained by giving such large doses. In some instances the results will not be so satisfactory, for when pushed beyond a certain limit potassium iodide lowers the blood-pressure and so quickens

the action of the heart that the circulation in the aneurism is too excited for the deposition of clot to occur. Since calcium salts are known to favor coagulation of the blood he has administered these in various forms, but without obtaining results as satisfactory as those from potassium iodide alone. Even with this potassium salt there are few real cures of thoracic aneurism, although great relief is obtained. While in distal aneurisms spontaneous clotting of blood may occur that leads to cure, this, owing to the situation, is very seldom the case in thoracic aneurisms.

The author has had no experience in carrying silver wire into the interior of an aneurism, nor of needling. Several cases of aneurism he has treated by the subcutaneous injection of gelatin into the tissues in the neighborhood of the sac. Some of the patients complained of great pain in the part afterward, while in others there was always a slight rise of temperature and considerable discomfort. In a few of the patients thus treated the pulsations of the aneurism became less marked and the tumor became harder and shrunk. Several of the patients left the infirmary much better, but the cure was never complete, for in some of them the sac ruptured weeks or months afterward. Apart from the pain which the subcutaneous injection of gelatin causes there is another risk that has to be borne in mind. Tetanus followed gelatin injections in one of the London hospitals, and as it is extremely difficult to sterilize gelatin, this risk, although no doubt remote, must be borne in mind.

The author has had a limited experience with galvanopuncture; he has seen one case of subclavian aneurism thus treated, and in which for several months the result was satisfactory until, after friction caused by the workman carrying his spade on the affected shoulder, the aneurism redeveloped and burst into the surrounding tissues, causing a hematoma which began to ooze through the skin, but in which the blood subsequently coagulated, and the aneurism was finally removed.

One of the difficulties of treating thoracic aneurism is in getting the subjects of the disease to be patient under treatment. Rest in bed and the restricted diet in time become irksome to the patients, who, once they feel rather better, long for freedom. If when the pulsation of the tumor has lessened and the sac has become smaller and harder, patients can be got still to carry out the rest cure, the results are, as might be expected, more satisfactory.

CHLORIDE OF ETHYL.

At a meeting of the London Society of Anesthetists on March 1, a paper on "Some Points in Connection with Ethyl Chloride" was read by Dr. Z. Mennell. The reader gave his reasons for having largely discontinued the use of this anesthetic, his deductions being based upon a large number of cases at St. Thomas's Hospital. He brought evidence to show that ethyl chloride increased the coagulability of the blood, and that in consequence of this pulmonary embolism occurred, after the use of the ethyl chloride-ether sequence, more frequently than when ether was preceded by nitrous oxide. The frequency of such cases—at any rate at St. Thomas's—had coincided in time with the introduction into common use of ethyl chloride. Dr. Llewellyn Powell was glad to hear a paper which took a pessimistic rather than an optimistic tone in its view of ethyl chloride. He had met instances of embolism after anesthetics, but not as yet in connection with the use of ethyl chloride. Dr. Sill thought that ethyl chloride is most useful, provided it is given in an open way. He employs it in large doses with free air dilution, not to obtain anesthesia, but merely a degree of insensibility sufficient to allow for the rapid and convenient introduction of such an anesthetic as the A. C. E. mixture. Dr. Kirkby Thomas alluded to the peculiar smell attaching to patients just after operation when they had inhaled ethyl chloride. Mr. Cuthbert Wallace was able from his own observations to confirm the opinions of Dr. Men-

nell. When the anesthetic is in the hands of a comparatively inexperienced administrator he is often subjected to anxiety if ethyl chloride is employed. Dr. Blumfeld regretted that the reading of the paper had not brought forward more details as to the cases of pulmonary embolism. He was curious as to the nature of an operation in these cases and as to the extent to which ether had been used after the ethyl chloride. Personally he found ethyl chloride very useful before ether in muscular and in alcoholic individuals. Dr. Kingsford could not corroborate Dr. Mennell's conclusions as to detrimental after-effects from ethyl chloride. Moreover, in 10,000 cases at the Throat Hospital artificial respiration had been required on only two occasions. Dr. Walter Tyrrell thought that very likely some of the ill effects described were due to the fact that ether was used to excess in immediate sequence to ethyl chloride.—*British Medical Journal,* March 16, 1907.

THE TREATMENT OF RODENT ULCER BY ZINC IONS.

JONES (*British Medical Journal,* Feb. 16, 1907) notes that both the *x*-rays and radium give good results in the treatment of rodent ulcer. Indeed, he holds that cure ensues in a large proportion of cases. He notes the obvious difficulties attendant upon these treatments and holds that the introduction of ions of zinc into an ulcer by means of a continuous current is a simpler and more practical therapeusis. Jones states that most of the cases he has treated have been small ulcers, less than an inch in diameter.

Of nineteen cases the results have been favorable with the exception of five. The philosophy of the treatment is incident to the fact that zinc ions with the positive charges move toward the negative pole, and conversely the negatively charged sulphuric ions move toward the positive pole, so that the electrolysis of a solution of zinc sulphate tends to cause a concentration of sulphuric acid at the positive pole, and of zinc at the negative. This movement of the ions is made use of to introduce them into the body, and if at the positive pole there is lint or cotton-wool moistened with a solution of a zinc salt, and if the negative pole be placed on some other convenient part of the patient, the zinc will begin to move inward on its way toward the negative pole directly the current begins to flow, and although in the time of an ordinary application it cannot reach the negative pole, yet at least it starts upon its journey, so that in an application which lasts ten minutes some of the zinc ions will penetrate to a depth of one, two, or more millimeters into the tissues beneath the positive electrode, which may be enough to enable it to permeate the diseased area if it be a superficial one. The sulphuric ions of the zinc sulphate solution do not migrate inward from the positive pole but move toward the electrode, and if the electrode is made of zinc they combine with the metal to form more zinc sulphate; thus the supply of fresh ions of the metal is maintained, and the quantity of zinc sulphate present in the moistened pad remains much the same at the end of the application as at the beginning.

The electrochemical equivalent of the metal, multiplied by the magnitude of current used and by the duration of the time of application, gives in the case of zinc the following result for a current of 10 milliamperes for ten minutes, namely, a little over 2 mg., and although this does not appear a large quantity it is effective because concentrated at the place where it is wanted.

The apparatus required for the treatment of rodent ulcer by zinc ions is extremely simple. An ordinary medical continuous current battery, with a galvanometer, a pair of wires, a flat pad for completing the circuit at the negative pole, and a rod or other electrode of zinc attached to the positive pole, completes the outfit. The zinc must be covered with three or four layers of lint, which serve as a reservoir to hold the zinc solution, a two-per-cent solution of the sulphate being very suitable. The zinc should be freshly cleaned or amalgamated, and the solution should be made to penetrate electrolytically from the positive pole. Before using the zinc solution a tuft of wool mois-

tened with cocaine solution is applied to the surface of the rodent ulcer and a current is passed in with the zinc electrode, exactly as for the introduction of the zinc. The solution of cocaine should be a pure one. Where the ulcers are nodular or thickened in parts the zinc needle is used attached to the positive pole. Of Jones's nineteen cases, six healed completely after one introduction of the zinc ions; three have required two applications, and five have required three. Five others have not yet been finished, or have been unsuccessful.

THE EARLY MOBILIZATION OF PATIENTS AFTER MAJOR GYNECOLOGICAL OPERATIONS.

BROTHERS (*Medical Record,* March 23, 1907) lets his patients severely alone during the first twenty-four hours after operation, the nurse being directed to place the pillows comfortably under the head and shoulders. If all goes well the patient may sit upright in bed for a few minutes, supported on the nurse's arm on the second or third day; later by a few hours she may be propped up by pillows in a sitting position during a quarter of an hour. The following day she may be in this sitting posture in bed for an hour in the forenoon and an hour in the afternoon. After that she can be gently placed in a chair for a reasonable period of time during each succeeding day. On the first evidences of faintness or rapid pulse the patient is returned to bed, and no further efforts at mobilization are made for several days.

Brothers asserts that although he has been obliged to desist from and postpone active mobilization in a number of cases because of wound disturbances he has had no fatal complications, and has been satisfied that wound suppuration when it did occur was independent of the movements and was due solely to purulent matter soiling the wound edges at the time of operation, or from ligature material.

Early mobilization of abdominal operations is possible when the plaster binder of Boldt is on the patient. This plaster surrounds the body of the patient, and the serrated ribbons so overlap each other in front that the abdomen is supported from below upwards and held in a vise-like grip. From the beginning these patients are allowed to drink freely of water, albumen-water, peptonized milk, beef extracts, and orange juice. This early mobilization tends to overcome ordinary vomiting, accumulation of intestinal flatus, and the bronchial irritation of retained secretion in the air-passages.

Instead of adding to the risks of thrombosis and embolism in the absence of infection the early moving about of patients actually tends to reduce these risks. The morale of these patients is always wonderfully improved, and a tendency to debility, hysteria, and mental states of depression and anxiety correspondingly diminished. There results an earlier and more pleasant convalescence. According to Ries, the method prevents muscular atrophy, conduces to a rapid recovery of strength, and permits of the discharge of patients from the hospital in about twelve days.

The contraindications to the early mobilization of these patients are: Shock or collapse preceding, during, or subsequent to operation; organic lesions of the heart, the kidneys, or blood-vessels; great debility in extreme old age; rapid heart action after operation, with or without rise of temperature; persistent elevation of temperature after operation from any cause signs of peritonitis; complications like pneumonia, diarrhea, dysentery. Nor is early mobilization indicated after suspension, fixation, and prolapsus operations, hernia operations, vaginal plastic operations (especially on the perineum) associated with laparotomy, or in the presence of drained and suppurating abdominal wounds.

RESULTS OF TENDON TRANSPLANTATION.

The operation of transplantation of tendons for the relief of partial paralysis is warmly praised by HOFFA (*Archiv für klinische Chirurgie,* Band lxxxi, Heft 1), who reports the results of 173 cases, in which he was able to learn the result at least a year after. Of these 98 were for

clubfoot, 62 for paralysis, and 13 for other conditions.

The first requirement for success is proper preliminary treatment. This consists in correction of the deformity, and the use of a retention dressing for several weeks or months according to the case. Flatfoot and pes equinus are treated for two months before the operation is performed. The transplanted muscle must not have any increased strain thrown upon it, or it will gradually stretch and give way. It must not be expected to correct the deformity after the operation. In severe cases of paralytic contracture of the knee, supracondylar osteotomy should be done first, and the tendon operation not until six weeks later.

The second factor is exact knowledge of the condition of all the near-by muscles. The operation is only of use when very few muscles are affected. The active movements should be studied in the original position and in the correct position, noticing which muscles contract and how forcibly. They are then studied electrically, and the state of each separate muscle is noted. The gait is also studied, to see which ones are freely used. If there is any doubt as to the condition of a muscle which it is proposed to transplant a longitudinal incision is made in its sheath and the color noted. This is dark-red if the muscle is healthy, yellowish if paralyzed, and rose-red if it is entirely degenerated. Only healthy muscles are to be transplanted.

The third point is the technique of the operation itself. Extremely careful asepsis is essential, and to prevent necrosis the Esmarch tube should be removed several minutes before any dressing is applied after the operation. As regards the muscle, it must have the proper tension, the tendon being shortened if necessary, so that it assumes a straight course between the origin of the muscle and the new point of attachment. When equally easy it is better to fasten it to the periosteum rather than to the tendon of another muscle. The lower part of the muscle and the tendon must be freed from adhesions to neighboring muscles, so that they may play freely. If possible the entire muscle should be used, but it is sometimes necessary to divide the tendon of a muscle which cannot be completely sacrificed. In this case the muscle must not be divided above the center of the belly, as there is danger of interference with the blood supply. Occasionally the part split off will learn to functionate separately, but as a rule the two parts of the muscle continue to act together, and for this reason no part of a muscle should be so arranged that it antagonizes the main body. If the muscle seems unduly relaxed it should be shortened by folding the tendon on itself. In some cases a muscle which seemed almost entirely degenerated and which was very much relaxed has shown power to regenerate after it was brought into action by shortening the tendon. This is particularly seen in the muscles of the back in cases of paralytic scoliosis.

Finally, the after-treatment is of major importance; this consists in holding the limb in a position of overcorrection, for six to eight weeks. The retention apparatus must be removed for massage and electrical treatment, and therefore if a plaster cast is used it must be cut in half, forming two gutters. Some form of support must be worn for at least six months after operations on the legs.

The operations on spastic affections present certain peculiarities. The spastic muscles can be used to replace the paralyzed antagonists. The paralyzed muscles can often be brought back to usefulness by shortening their tendons, and in some cases this operation associated with simple tenotomy of the spastic muscles suffices to correct the deformity. Transplantation is of especial value in the pronation of the forearm, which is always found in infantile cerebral paralysis. The pronator radii teres may be removed from its point of origin and fastened to the external condyle. If preferred, the same muscle may be freed at its insertion, passed through a slit made in the interosseous fascia, passed around

the radius, and attached in its original position. In either case the muscle is changed to a supinator. In some cases of progressive muscular atrophy with slow course transplantation may yield good results, but it is not often indicated in progressive diseases. The result cannot be considered entirely satisfactory, unless the form and motility of the limb are both preserved, but in many cases the motion, although not perfectly free, is enough so for most purposes, and the condition is so marked an improvement over the former state that the result may be considered good. The details of various operations are given.

THE RESORPTIVE POWER OF JOINTS.

It has long been taught that the inner lining of the joints was an endothelium, like that of the large serous cavities, but HILDEBRAND (*Archiv für klinische Chirurgie,* Band lxxxi, Heft 1) states that the researches of Braun have shown the incorrectness of this opinion.

The synovial membrane is not lined with endothelium, but with a tissue resembling the cornea, and perforated by connective tissue spaces, which communicate with the interior of the joint and take the place of the stomata of serous membranes. These communicate with large spaces in the looser tissue below. The inner layer of the membrane is supplied by a dense network of blood-vessels and nerves, the latter showing many corpuscles of Vater, which are sympathetic sensory endings. The cartilage is also rich in blood-vessels. Whereas the fluid of serous cavities is derived from the blood plasma, that of the joints shows large amounts of mucin, which gives it a viscid character. There are no special cells to secrete this substance, but it appears that the cells of the synovial membrane are especially prone to degeneration, and where there is not much pressure this takes the mucoid form. Where there is joint pressure they form cartilage. The fluid also contains cell detritus from breaking down of the superficial layers. The amount of plasma is quite small, and is lessened by use of the joint, which is therefore not irritating to the surfaces, under normal conditions. In spite of the free blood and lymph supply, the absorptive power of joints is not as great as that of serosa. Fluids injected into the joints are absorbed fairly rapidly, but any solid particles, no matter how finely divided, are not taken up for a long time, or even not at all. Absorption is more rapid if the synovial membrane is incised. Effusion into the joint is caused by any irritant which acts upon the membrane, and in cases with chronic effusion into the joint there seems to be an increased irritability which induces an effusion even from the slight excitation caused by use of the joint. The rational treatment would therefore be the reduction of this irritability, and it is probable that the various substances which are used by injection into the joints act in this way. The mucoid synovial fluid should first be removed by washing with sterile salt solution, and the membrane treated with tincture of iodine or carbolic acid. This destroys the superficial layer of the membrane, and the newly-formed surface will probably not be irritable. Concentrated carbolic acid is preferred by Hildebrand, on account of its anesthetic and astringent properties.

PROLAPSE OF THE RECTUM—OPERATION OF CHOICE.

The operations considered by LENORMANT (*Revue de Chirurgie,* xxvii, 3) are resection, resection of the mucosa, colopexy, rectopexy, and colopexy with section of the bowel. Of the last so few have been performed that no idea of its value is obtainable.

Total resection of the prolapse should be entirely abandoned on account of its mortality (10 per cent). Resection of the mucosa alone is the operation which boasts the greatest percentage of cures. No recurrence has as yet been reported. On the other hand, it has shown a mortality of 2 cases in 25, both from infection of the wound. If it can be shown that these bad results were due to errors in tech-

nique, and that deaths are avoidable, it would be the operation of choice. Rectopexy and colopexy have given almost equally good results, but the latter was used in more severe cases, and the balance is therefore in its favor as regards such cases. Rectopexy is a simpler operation and more nearly restores normal anatomic relationships, and is at present the operation of choice in simple cases, in which the prolapse is not more than four inches long. Colopexy may be reserved for large prolapses, and for those which have recurred after other procedures. Neither operation has any mortality. The final result of colopexy is improved if the perineum is strengthened at the same time by making a tuck in the levator ani muscle in the middle line. This prevents hemorrhoids.

GASTRIC ULCER—PERFORATION.

Two articles by KOERTE and BRENTANO respectively (*Archiv für klinische Chirurgie,* lxxxi, 1) are devoted to this subject.

The statistics and symptoms of Koerte's cases do not differ from those of others. He insists very emphatically on early diagnosis and immediate operation. Of his 19 cases, 4 had never had gastric symptoms, and 3 had no suspicion of ulcer. The perforation occurred without warning, at any time of day, and even during sleep. Gastroenterostomy on account of ulcer had been performed in 4 cases, and in 3 of these the perforation was at the place of suture. The pain is sudden and agonizing, with a sense of something giving way. Collapse follows soon, but tends to pass off. The abdominal wall is tense. Operation may be performed during the collapse period; delay is more dangerous than waiting for the reaction. The hole having been found, it is simply sewed up and the spot is covered with omentum. If the edges are too soft to hold sutures they must be trimmed back to firm tissue. It is not wise to excise the entire ulcer except in special cases. When the condition of the patient gives time, gastroenterostomy is performed. Drainage is best dispensed with whenever possible. The abdomen is flushed thoroughly with hot saline solution. Spoonfuls of cold tea are given every hour as soon as the effect of the ether has passed, and nutrient enemata are given for three days. In eight days soft food is given. Of the 19 cases, 13 were cured; 6 died, 2 because of failure to find the ulcer.

Brentano gives in detail the histories of 48 cases, which include those mentioned by Koerte, and considers the rare symptoms and difficult diagnoses encountered among them. Nothing of importance is added to the article of Koerte.

GALL-STONES—RESULTS OF OPERATION.

The results of simple cholecystotomy with retention of the gall-bladder are warmly praised by KOCHER and MATTI (*Archiv für klinische Chirurgie,* Band lxxxi, Heft 1) on the basis of 100 cases; in 39 of these this operation was performed.

The gall-bladder should only be removed when it is so altered that it cannot repair itself, when there is danger of perforation on account of degeneration or ulceration of the wall, or when there is irreparable obstruction of the cystic duct. Cholecystostomy is preferred when the bladder is inflamed and removal would be difficult on account of adhesions, and when the bladder is so little altered that a return to normal can be hoped for. In cholecystotomy, the duct is sounded to show that it is patulous and free from stones, and the bladder and abdomen are closed without drainage. None of the cystotomy cases died as a result of the operation. Two of the cystectomy cases died of peritonitis, one through slipping of the ligature. Most of the cystotomy cases were discharged inside of fourteen days. The cystostomies were kept until the fistula closed, which it did in less than a month in most cases. The final result was learned in 82 of the cases. Six have died—four of cancer; two of peritonitis,

in one of unknown origin, the other (cystectomy) from perforation of a new-formed gall-stone. During convalescence, inflammatory conditions of the lungs were noted in three cystectomies and in one cystotomy. The greater number of the cases have been permanently relieved. In seven cases there has been some return of symptoms, but in two of these only slight distress. Of the other cases three were cystotomy, and 1 each cystostomy and cystectomy. On the results seen, the authors give their unhesitating preference to the simple operation whenever it is not contraindicated by complications.

TUBERCULOSIS OF THE BLADDER—TREATMENT.

The possibility of curing vesical tuberculosis by local treatment is shown by ROVSING (*Archiv für klinische Chirurgie*, Band lxxxii, 1) in a masterly article.

The treatment must always be inaugurated by removal of the diseased kidney, when only one is affected, but in addition the bladder should be treated directly. He shows by a large number of specimens removed at operation and at autopsy that the infection may spread up the ureter if the lower end of this is obstructed by a lesion of the bladder. In several of his cases the lower end of the ureter or even its entire extent was diseased and the kidney showed no sign of tuberculosis. This was mostly seen on the sound side in cases of unilateral kidney lesion with consequent infection of the bladder. This entirely controverts the theory that infection never can ascend against the urinary stream. In three cases there was disease of the bladder and of both ureters, but both kidneys were free from infection. Of his 56 cases of vesical tuberculosis, the kidneys were both sound in 9. Of 75 cases of renal tuberculosis (all of which were unilateral), the bladder was sound in 28. The bladder was ulcerated in about two-thirds of the cases of renal tuberculosis and in more than one-half of the operable (unilateral) cases. The diagnosis was, at first, either nephritis, pyelitis, or cystitis, and in all such cases a careful microscopic study of the urine should be made, and if it contains pus or blood, tubercle bacilli should be looked for. The presence of pus in the urine, in the absence of the usual pus organisms, is almost conclusive evidence of tuberculosis. The bacilli will generally be found if the urine is collected for twenty-four hours, the albumin precipitated, and the sediment thus obtained examined. The specimen must be decolorized with alcohol as well as acid, as the latter does not decolorize the smegma bacillus.

The only certain way to determine which kidney is affected, or whether both are diseased, is by means of ureteral catheterism. Cystoscopy may be entirely misleading. In the 37 cases of unilateral disease, both sides of the bladder were affected in 20, only the affected side in 14, and only the sound side in 3. Segregation is thus a very uncertain method. The catheterization of the ureters will ordinarily give exact information, but as has been stated, the ureter was affected in three cases in which the kidney was free, and in one of these cases nephrectomy was performed, a sound kidney being removed. In doubtful cases and when ureteral catheterization is impossible, the only safe plan is to expose both kidneys by lumbar incision and determine positively if either is free from disease. The lesion having been located as unilateral and the affected organ removed, we may wait for one or two months to see if the ulcers of the bladder will not heal spontaneously. If the vesical lesion still shows a tendency to spread, the local treatment of the bladder should be instituted.

After trying sectio alta with cauterization of the ulcers, applications of potassium permanganate, each of which seemed to hasten the spread of the disease, and pyrogallic acid, which had very little effect, Rovsing adopted the use of 5-per-cent carbolic acid, and has since then succeeded in curing every case in which no advanced visceral lesions existed elsewhere. The bladder is first washed clear of pus, and

then 50 Cc. of a warm 5-per-cent solution of carbolic acid is injected and retained for three to four minutes. If the fluid comes away turbid the procedure is repeated until it returns clear. A three-tenths-grain morphine suppository is introduced, to lessen the pain which occurs two or three hours after the injection. This is repeated every other day until the urine remains fairly clear between, and the interval is then gradually lengthened. Treatment has lasted from one to as much as six months. No result is to be expected from this or any other treatment unless the diseased kidney is first removed.

TUBERCULOSIS OF THE BLADDER AND KIDNEYS.

The possibility of tubercular infection ascending from the bladder to the kidney is categorically denied by KÜEMMEL (*Archiv für klinische Chirurgie,* Band lxxxi, Heft 1), who believes that even when the bladder is infected before the kidneys, infection of the latter occurs through the blood.

He states that he has never seen a case of vesical tuberculosis without lesion of the kidney. It is not probable that the second kidney can be infected through the ureter, after the bladder is infected by the first. The condition demands early operation. "Early" means before local symptoms have appeared, and before there is disease of the ureter or bladder. Infection of the bladder will often heal spontaneously after removal of the diseased kidney, and it should never be treated operatively. In most cases the first symptoms are vesical, and examination shows only turbid urine, in which by careful study bacilli are always found. Every cystitis which does not depend on gonorrhea or catheterism is suggestive of tuberculosis. In cases of long-standing gonorrheal cystitis the bacilli should be sought, as gonorrheal infection predisposes to tuberculosis. In many cases in women the trouble is ascribed to the pelvic organs instead of the bladder. Cachectic symptoms are more prominent than local ones. In doubtful cases the ureters should be catheterized, as cystoscopy will not always show which side is affected. Administration of indigo-carmine will show clearly the orifice of the ureter. If the bladder is first washed out, there is no danger of infecting the sound kidney.

The only surgeons who object to catheterization of the ureters are those who have not mastered the technique. Tubercular urine is generally pale and clear or slightly turbid. In case the bladder is badly diseased ureteral catheterization may be difficult or impossible. In these cases the question of the function of the better organ may be decided from the freezing point of the blood, which is reduced in bilateral disease. If it is normal, nephrectomy of the diseased organ may be undertaken safely. In cases in which the propriety of operating seemed doubtful, the most diseased kidney was exposed, split, and fastened in the wound. In this way the action of the two kidneys could be studied. When the ureter was much diseased it was removed, or if only the upper end seemed to be affected, this was resected and a galvano-cautery inserted in the stump, heated to white heat, and withdrawn. A strip of gauze is laid in the wound, which is almost closed. The prognosis of the operation in early cases is entirely favorable. The deaths after the operation are almost entirely dependent on progression of lesions in other parts of the body. The recent operative mortality is less than three per cent.

APPENDICITIS—WHEN TO OPERATE.

The idea that all cases of acute appendicitis should be operated on at once, "because suppurative cases cannot certainly be distinguished from catarrhal," is combated by SONNENBURG (*Archiv für klinische Chirurgie,* Band lxxxii, 2).

In all acute attacks of appendicitis there will be fever, rapid pulse, and leucocytosis. If these three symptoms agree or correspond to each other, the case is presumably

catarrhal, and we may safely wait and operate in the interval. If the pulse is very rapid and the temperature not much elevated, in the presence of marked local resistance, the case is malignant, probably gangrenous, and operation is not to be delayed. If the leucocytosis is low in the presence of a bad general condition, the prognosis is very grave, as it shows that the defenses of the system are not adequate. The more closely the three symptoms agree the better is the prognosis, and the more one of them differs from the others the more serious is the case. All three symptoms should be carefully watched in all cases of abdominal inflammation.

HEMATURIA IN INFANTS AND YOUNG CHILDREN.

PARKINSON (*British Journal of Children's Diseases,* February, 1907) notes that in urines, especially those which are alkaline, the red corpuscles tend to break up on standing, hence it is important to examine a fresh specimen if any doubt exists as to the presence of red corpuscles. The ordinary guaiacum test if done with fresh materials is a very delicate one, and the presence of iodides, pus, saliva, or milk in the urine gives a very similar reaction. Caustic potash test is also given by the urine of patients taking senna, rhubarb, santonin, or chrysarobin, which drugs are frequently administered to children; hence the microscope is the safest method to employ. More severe hemorrhages usually come from the kidney, in which case the presence of blood casts from the renal tubules is distinctive. In infants under one year old the cause is generally scurvy, renal sarcoma, or uric acid crystals. These may occur in the shape of deposits in the renal tubules and in the pelvis of the kidney, and the hematuria is occasionally accompanied by pain and priapism apparently of the nature of renal colic. At times hematuria may be the only obvious sign of infantile scurvy, though on closer examination other signs, such as tenderness of limbs, etc., may be discovered. Hematuria is one of the most frequent of the visceral bleedings of purpura hemorrhagica. The amount of the blood varies with the severity of the disease. The cause is not often in doubt, as in such cases the bleedings under the skin and from the mucous membranes are such as are only seen in cases of scurvy, or in hemorrhagic forms of the various acute specific fevers, or in the rare condition known as Henoch's disease.

In acute specific fevers hemorrhagic types are sometimes seen complicating measles, diphtheria, influenza, etc. In hemophilia bleeding from the kidneys may follow a slight traumatism.

Chlorate of potash has frequently caused blood in the urine. Salicylate of sodium will also produce this same result. The symptom is also noted after eating rhubarb or strawberries. In these cases it is usually accompanied by large numbers of octahedral and dumb-bell crystals of calcium oxalate.

Guthrie has described a hereditary or family hematuria, in which twelve members of the family exhibited this symptom for many years. The children were otherwise healthy. Renal calculi in the kidney, pelvis, or bladder may cause hematuria; and when in the kidney or pelvis the accompanying symptoms of pain or colic, and occasionally the Roentgen rays, may facilitate the diagnosis; while in the bladder a calculus may often be felt by rectal palpation.

Bleeding from the kidney is sometimes a precursor of tuberculous infection. The treatment in the hematuria of scurvy accomplishes a prompt, indeed almost immediate, cure. In hematuria accompanying purpura hemorrhagica the rectal injection of polyvalent antistreptococcus serum has, according to Parkinson, accomplished extraordinarily successful results. The hemophilic hematuria has not been benefited in any way by the administration of calcium chloride, though successful results are reported from the use of both ergot and adrenalin. The bleeding following scarlet fever or influenza is benefited

by cupping. In all cases of bleeding from the kidney milk diet and rest in bed are imperative.

INTERNAL DERANGEMENT OF THE KNEE.

The affections of the knee following injury are divided by KÖNIG (*Archiv für klinische Chirurgie,* lxxxi, 2) into (1) injury of the crucial ligaments; (2) of the villi; (3) loose bodies.

Trauma may cause rupture of the crucial ligaments if the knee is overextended or strongly twisted. In internal rotation the anterior ligament is ruptured; in overextension, both. If the knee is flexed and the leg driven forcibly backward the anterior, and if forward the posterior, ligament is torn. The ligament may tear across at any point, or a small piece of bone may be torn off by it. This is usually from the femur. The symptoms are hemarthrosis and pain, followed by uncertainty in the joint, with lateral wobbling or possible internal rotation. Diagnostic is the possibility of pushing the flexed leg back and forth along the articular surface of the femur. This is less often seen, however. There may be very little swelling. The only characteristic symptom which is present soon after the injury is the appearance of a small piece of bone free in the joint, shown by the *x*-ray. In late cases there is a tendency to effusion into the knee, pain, abnormal mobility and unsteadiness, and operation is often indicated. The condition may heal even in severe cases if the joint is put at rest and massage used properly. If disability of the joint continues, it should be opened and the torn ligament sewed.

The injuries of the ligamenta mucosa and alaria, which pass from the patella to the femur, produce rupture or crushing of these bodies. They follow the same forms of trauma as do those of the crucial ligaments when the twist is not so severe. The symptoms are local swelling with pain and weakness, and a tendency to impaction. There may be atrophy of the quadriceps. If the condition does not tend to recovery the joint should be opened and any inflamed or enlarged fat bodies removed. In some cases free bodies in the joint will be found. It is not wise to remove more of the ligamenta alaria than is affected.

Traumatic affections of the villi frequently follow a long time after the injury. The normal villi becomes enlarged by inflammation and new-formed connective tissue, and may contain deposits of lime; they intrude between the joint surfaces. In some cases the villi are congenitally large, and cause trouble from childhood on, this being much increased if they are inflamed by injury. Ordinarily the villi are not sensitive, but like the peritoneum, they become so when inflamed. In some cases the villi seem to be remains of fringes from a torn edge of a ligament following traumatic rupture. The impaction of the joint is ordinarily produced by the pinching of the enlarged villus between the ends of the bones, but in some cases folds and adhesions in the capsule are left after the injury and the villi are caught in the pockets formed in this way. This is especially likely if there was a hemarthrosis at the time of injury. The diagnosis is easy if the enlarged bodies can be felt from the outside; if not, the diagnosis is probable if there is a constant localized tenderness at one point in the capsule. The occurrence of crackling has little significance. The diagnosis from loose bodies is at times almost impossible, but impaction is more common with enlarged villi. The treatment is excision of the enlarged villi, and is most satisfactory in all cases.

Loose bodies produce much the same symptoms. They often result from the small pieces of bone which are torn off by the crucial ligaments. In some cases they are apparently produced by necrosis following embolism of an artery in the articular surface (osteochondrolysis). The diagnosis is not always easy. The occurrence of pain, swelling, and limitation of motion in a large joint leads to the

thought of tuberculosis, and if the joint is fixed and injections of antiseptics used great harm will be done. If the joint is operated on the diagnosis is at once clear. In most cases the *x*-ray will show the free body, and may show a corresponding defect in the cartilage of the femur. If there is much deformity of the joint the diagnosis of traumatic arthritis deformans is justified, and this is not benefited by operative treatment. When possible the body is removed through a very small incision under local anesthesia. The finger should not be inserted in the joint on account of the danger of infection. As a rule the only condition which demands free opening of the knee is rupture of a crucial ligament. In one case a vertical incision was made on each side of the patella, and these incisions were connected by a transverse one over the kneecap, which was sawed through obliquely and turned back. The exposure of the joint and the union of the patella were alike perfect.

SPINAL ANALGESIA IN ONE HUNDRED CASES.

BARKER (*British Medical Journal,* March 23, 1907) notes that spinal analgesia has been shown to be generally applicable only to the lower half of the body, though some few use it for operation on the thorax or even higher. He has employed stovaine in all of his one hundred cases, and notes that no drug yet employed has so far given as absolute uniform results as to the effects, the site affected by the analgesia, and the complete absence of by-effects which led to the misuse of cocaine in this field. The waywardness which has been occasionally seen by all operators has manifested itself in various ways: First, it has been noted that even where lumbar injection has been accomplished to all appearances correctly no effect whatever has followed the injection. Second, where analgesia has been more or less produced it has been found in a few of the earlier cases to affect a region other than that required for operation, nor have these disconcerting results been fully explained. Finally, it is known that in a large series of cases injected with the same amount of the same drug no by-effects may be seen, and then two or three cases may be troubled with a considerable sickness or a headache.

Barker believes that when no effect follows the injection it is due to the fact that the needle has only partially entered the dura, the injection not entering the sac at all or only partially.

The technical problem lies in entering the lumbar dural sac with the needle and discharging all the contents of the drug directly into the cerebrospinal fluid below the termination of the cord. The spinal cord terminates at the lowest point opposite the first lumbar vertebra. The lumbar dural sac extends about as far as the third sacral vertebra. Below the third lumbar spine, however, an ordinary needle puncture would be extremely difficult, hence the second and third lumbar interspaces are chosen. Puncture in the middle line is the easiest, safest, and best course; also it is the least painful. Here the analgesic compound passes freely into the spinal fluid, and reaches both sides equally, and can move freely upward or downward from the point of entry. Afterward it can be influenced in various ways and for various objects according to its weight relatively to that of the spinal fluid. The fourth lumbar spine is recognized by being on a level with a line uniting the highest points of the two iliac crests across the back. The hollow needle is thrust in just above this or in the third spinal space, and is aimed straight forward and a little upward. In some very stout people it is often difficult to find the spine with the finger, and the point of the needle may strike bone. Its upward slant is then varied, and this will usually be sufficient for success without a fresh puncture if the back has been well rounded so as to obtain the greatest amount of separation between the spines. In powerful, middle-aged men where the spines are clubbed or twisted at their

ends or even overlapped, there may be complete failure to reach the sac. Three of such cases were found in the author's series of 100. The needle employed has a close-fitting stylet and a hollow point so as to give sharpness without lengthening the terminal opening too much, the object of this being to enable the whole of the open end of the needle to lie within the dura without the point being pushed so far as to wound any of the structures within the sac. The hollow needle armed with its stylet is thrust through the skin sharply and pushed for about an inch in the direction given, when the stylet is withdrawn. The needle is then pushed on steadily, and as a rule easily. After it has passed the supraspinous and interspinous ligaments very little resistance is felt; it is rather as though it were crossing an empty space. Finally there is a sensation of having punctured a tense membrane, and the spinal fluid flows out in rapid drops, or, more rarely, in a continuous stream. If the drops come very slowly the needle may turn round a little on its axis, when they will usually come more rapidly. In no case should the analgesic compound be injected unless the fluid runs satisfactorily. When about 10 cubic centimeters of liquor spinalis has run off into a measure-glass the slender cannula attached to the syringe is inserted and pushed home, and the previously measured compound is delivered into the sac by a slow thrust of the piston. The patient is then rolled over on the back and the pelvis is raised a little.

INTRANASAL SUTURE.

On this topic the *American Journal of Surgery* for March, 1907, comments as follows:

It is doubtful whether any recent innovation in rhinological technique is as striking in originality of conception, or in the promises that it holds, as is the operation of intranasal suture conceived by Sidney Yankauer, of New York, and demonstrated by him on January 2, before the Section on Laryngology and Rhinology of the New York Academy of Medicine. That the wound made by removal of a hypertrophied turbinate, for example, does not have to be left to heal by granulations, but can be made to close per primam by the introduction of sutures, is startling enough; but that the means of accomplishing this are not complicated nor difficult leaves one wondering why it was never done before. It is, indeed, surprising to behold how, with simple tools and simple technique, sutures can be introduced and tied in a wound extending far back in the naris.

Yankauer's method and his instruments are the following: Through both edges of the wound in the mucous membrane a catgut stitch is passed by means of a needle shaped like a small Deschamps ligature carrier (right or left, as needed, and sharp at the point). The suture end is caught with a small hook and pulled out of the nose, and the suture carrier (needle) is withdrawn. A single knot is made in the catgut, one end of which is then passed through the eye of an instrument, consisting of a slender shank bearing a ring at its extremity. With this —acting practically as a prolongation of the index-finger—the knot is pushed up into the nose. A second knot is similarly carried up to the wound, and the sutured ends are cut off. The remaining stitches are introduced in like manner.

The advantages of such a procedure after turbinectomy are very evident. Yankauer reports that by securing primary union with sutures, healing is complete in one week; whereas when the wound is left to close by granulations, healing requires four weeks or more. Suturing, moreover, reduces the chances of secondary hemorrhage, and by eliminating inflammatory infiltration it ought to greatly improve the functional results.

But intranasal suture seems to have even larger claims. No one hitherto has succeeded in closing a perforation of the septum. By plastic operation and sutures Yankauer has succeeded in closing

two in three cases! Synechiæ, usually so obstinate, he says he can cure, with the help of sutures, at one operation.

That intranasal suturing will develop even further possibilities seems more than likely. Indeed, its originator has hinted at other applications he has already planned for it.

OPERATION ON RECENT FRACTURES AND DISLOCATIONS.

The indication for operation in most of the cases reported by SCHLANGE (*Archiv für klinische Chirurgie,* Band lxxxi, 2) was irreducibility.

Very few dislocations demand operation, but occasionally reduction is prevented by a fracture near the joint. If the upper end of the humerus is fractured at the same time that the shoulder is dislocated and reduction cannot be accomplished, the joint may be exposed by an incision 5 inches long, in the axilla, along the edge of the pectoralis and coracobrachialis. The vessels and nerves having been drawn aside, the capsule of the shoulder appears. The head of the bone is brought into position and the tear in the capsule sewed up. The fracture is reduced at the same time and sutured if it does not stay reduced. Operation on dislocation of the elbow was required in one case of an injury several days old, in which reduction was rendered impossible by callus from a small break in the lower end of the humerus. The joint was opened from behind, and the ulna sawed through obliquely, so that the olecranon could be turned up with the upper flap. The excessive callus was removed and reduction was then easy. The only case of hip dislocation was also complicated by fracture. As the neck of the bone was entirely shattered the head of the femur was excised. In some instances it was impossible to reduce dislocations of single bones of the carpus and tarsus without exposing the joint. The basal joint of the thumb is often dislocated, and in many cases the capsule of the joint is torn from its phalangeal attachment and spread over the metacarpus. In this case a short longitudinal incision is made on the palmar surface of the joint. The head of the metacarpus is immediately seen. The phalanx is drawn dorsally, and by strong traction is lifted so far that a small knife can be inserted between the two bones, and the tightly drawn capsule split by a longitudinal cut. A small hook is used to draw the freed halves of the capsule out of the space, and the hindrance being removed the bone returns easily to its place. The capsule and wound are closed. Passive motion begins in eight days.

The results of treatment of fractures would probably be improved if operation were performed more often on recent fractures. If the fragments cannot be brought into good position at once it is not wise to follow the recommendation of Bardenhauer, who thinks that weight extension will slowly effect perfect reduction. It is much better to operate at once. If the fracture is transverse the splinters at the ends of the bones can be fitted into one another and will hold the parts in position without suture. In oblique fractures suture is necessary, a hole being drilled through each part of the bone and aluminum bronze wire passed through them. In fracture of the tibia it is wise to pass the wire around the bone at the same time. Very heavy silk may hold even better than wire, and will not cut through the bone as wire is apt to do.

Fracture of the patella is sutured except in the following cases: (1) Comminuted fracture by direct violence, in which the lateral ligamentary bands are not torn; (2) when the skin is so injured that an aseptic operation cannot be assured; (3) complicating diseases, old age, etc.; (4) when operation is refused; (5) when the separation is very slight and the knee can be extended.

The patella is exposed by a longitudinal incision, the fragments brought together, an oblique hole bored in each, leaving the posterior surface free, the fragments wired together, and the lateral bands

united by catgut. Movements begin in two to three weeks. Fracture of the olecranon shows little tendency to heal by bony union unless sutured. The olecranon being exposed by a longitudinal incision, a hole is bored through the fragments, including as much bone as possible without exposing the joint. Through this silver wire is passed. The fascia is united with catgut. Motions are begun in two weeks. The collar-bone is only operated on to correct union in bad position.

ACUTE FRONTAL SINUSITIS.

MILLER (*Virginia Medical Semi-Monthly,* April 12, 1907) states that in his experience acute purulent disease of the frontal sinus is more often due to la grippe than any other cause, but it may follow acute coryza or any obstruction of the normal drainage. It is characterized by intense pain in the supraorbital region, which may radiate to the bottom of the eye, temporal region, vertex, or occiput. Percussion over the forehead is always painful. Upward pressure in the superior internal angle of the orbit against the floor of the sinus causes marked pain, and bulging is sometimes found at this point. The pain is usually in paroxysms, and is generally worse when first waking and increased by bending forward or blowing the nose, but between the paroxysms there is very seldom complete cessation of pain. The nasal passages are obstructed and there is profuse nasal discharge, which is at first whitish mucous, but later becomes yellowish and tenacious. The eyelid of the affected side may be red and edematous. Rhinoscopic examination will show swelling and congestion of the mucous membrane and the presence of exudate.

The treatment of these cases must be both constitutional and local. The patient should be kept at rest in the house, preferably in bed, the bowels emptied with a mercurial followed by a saline, and the diet should be light. Quinine, salol, aspirin, and belladonna may be used with benefit. Opium should not be used unless absolutely necessary to control pain. Hot applications to the forehead usually afford much relief. The nose should be thoroughly cleansed by an alkaline spray or douche, and then the congested tissues constricted by a spray of adrenalin, 1 to 10,000, which may be given to the patient to use every two or three hours. If within twenty-four or thirty-six hours there is not much improvement the anterior end of the middle turbinated body should be removed with forceps and cold wire snare. When these less radical methods prove insufficient for proper drainage, opening of the sinus through its anterior or inferior wall becomes necessary. When this is done, enough of the wall must be removed to permit a thorough examination of the cavity and enlargement of the nasofrontal duct to an extent sufficient for free drainage into the nose. If operation is delayed too long, the continued pressure may cause rupture through the floor into the orbit or through the posterior wall of the sinus into the brain cavity, with consequent purulent meningitis or brain abscess.

EXCISION OF MAMMARY CANCER.

DON (*Scottish Medical and Surgical Journal,* April, 1907) states that while it is commonly agreed that cancer spreads from the original focus along the lymphatic channels, metastases will not take place against the lymphatic stream early, but that after the nearest glands have been blocked by cancer growth the lymph must take a different course, and along this new course cancer cells may be carried and may in this way get into glands not normally receiving lymph from the cancer focus. In this way the overlying skin beyond the cancer focus may become secondarily affected and should in this case be removed at operation. The author has, however, never seen any more benefit to the patient from a wide incision through the skin, subcutaneous tissues, and muscle, and removal of everything except the ribs and intercostals as a routine method, than can be got from sparing the skin if at the

same time a wide area of subcutaneous tissues can be removed and a neatly closed wound left instead of a wide gap, which adds so much to the postoperative work of the surgeon and to the discomfort of the patient. He has not seen a case of recurrence in the skin thus left that did not impress him as originating in the parts below and pushing forward and involving the skin later. It is wise, therefore, always to follow up the lymphatic channels to their first lymphatic glands, and the lymphatic area just beyond their boundaries, if a radical cure is to be attempted. In order to make clear these generalizations the author gives a minute description of the lymphatic channels of the thoracic and mammary glands, which he says is based principally on Leaf's description. He asserts that it is necessary for the surgeon to understand this distribution of the lymphatics in order to intelligently perform the complete operation which he describes. He calls attention to the important fact that no lymphatic channels from the breast run immediately under the skin but in the deeper tissues, and that the skin will not be infected unless by peripheral infiltration from the cancer mass just below it.

The operative procedure is as follows: The hairs of the axilla are cut short with scissors, and, during a general bath, the whole side of the patient is thoroughly scrubbed with soap and water. This is done by the nurse or patient beforehand, and the field of operation is covered with mercurial wool, or, in private work, simply by clean underclothing. After anesthetization the patient is turned partially over to the sound side, and the pillow put under the shoulder and side to keep her in this position.

The mackintoshes are arranged by the nurse, who again washes the front and side of the thorax and the arm with ethereal soap. She then applies a depilatory, consisting of sulphide of soda and unslaked lime mixed with water, as a paste over the axilla and breast. This is left in position for a few minutes, when it is washed off with sterile or carbolized water. Sterilized towels are now laid over the mackintoshes, and a final wash with sterile water, and then with methylated spirit, by the surgeon himself completes the preparation. The object of the alcohol is more to harden the skin and to prevent infection of the wound by its maceration during the operation. Complete sterility of the skin, especially in the axilla and about the pelvis, is an impossibility, and the usual moist preparatory dressings tend to form culture media for the germs already there. The point for consideration, next to the complete removal of disease, is the after-usefulness of the arm, and here it seems that the usual incision along the middle of the axilla is the worst we could adopt, for as the scar contracts the arm becomes more and more bound to the side. The scars should radiate from in front of the shoulder-joint, and thus allow of perfect upward and forward movement of the arm.

The author prefers a double curve incision, the end of the one curve being over the shoulder-joint, and the other at the ensiform cartilage. This incision will run below the areola, round the nipple, and will leave at least one inch of healthy skin. From the shoulder the curve is continued across the external border of the axilla on to the arm and turned down in a wide curve to almost reach the inner border of the biceps muscle and well on to the arm. Another incision encircles the breast, and, if much of the skin over the gland has to be sacrificed, is carried down the side of the thorax. The flap in the axilla is then dissected back, skin only being reflected, and care being taken to handle the skin as little as possible, both for the sake of the vitality of the flap and to prevent infection of the wound. This flap should be covered with gauze after its reflection beyond the latissimus and teres major borders. The incision is then deepened until the pectoralis major is reached, which forms a good guide to enter the upper limit of the axilla by, as the fascia at its lower border, when dissected

back, reveals the vessels and nerves. These are first cleaned on their anterior and lower aspects (the anterior and internal anatomically) well on to the arm, all branches of the vein and artery to the side of the thorax, except the subscapular and dorsalis scapulæ to the posterior aspect, being at once tied and divided. The long thoracic nerve should be preserved if possible. The rest of the axilla is then carefully cleaned back to the latissimus and teres major muscles, and the thoracic wall down to the serratus. The fascia covering this muscle is also removed, as on it lie the thoracic glands.

This part, in the usual operation, is most often neglected, as it lies awkwardly to the surgeon and gets obscured by blood, and comes, too, at the end of the operation, when the surgeon is getting tired. This neglect is less likely to occur if the affected side of the patient is raised by a pillow before commencing to operate, and the axilla cleaned first. The apex of the axilla is then examined, and any other glands felt to be enlarged are now removed. To effect this the skin is reflected up the clavicle and across to the middle line. The subcutaneous fat and fascia are removed from the limit of the skin reflection toward the mamma and dissected inward toward the growth till the insertion of the pectoralis major comes into view. This muscle is cut through at its insertion, the finger being slipped underneath it as a guide. This exposes the pectoralis minor, which is cut through similarly, and both are turned down together toward the mamma. Some branches of the acromiothoracic axis will require tying. All fat and glands around the vessels are removed right up to the clavicle, and from the posterior triangle of the neck, if need be.

The axilla being cleaned, the most tedious part of the operation is finished before beginning the wide dissection which exposes so much of the thorax wall, and which must add considerably to the shock of the operation. The rest of the skin is quickly undermined, down to about three inches below the ensiform cartilage and behind back to the latissimus. All fat is removed from these skin flaps. The rest of the operation is a mere flaying of the chest wall down to the ribs. Bleeding is venous, except for a few internal mammary branches which need tying, and pressure will stop the rest. At this stage, when possible, the whole wound should be exposed to a full dose of x-rays, the center of the target being over the position of the nipple of the side from which the gland has been removed. This will occupy from ten to fifteen minutes, and the thorax may meantime be covered with sterilized gauze or towels. There seems to be so much reliable evidence of the selective destruction of superficial new growths by these rays that to use them is to give our patient the best chance we can of non-recurrence of the disease. When the cancer cells are again covered by skin the benefit to be derived is less certain, and destruction of the weak skin flaps is not unlikely if an effective maximum dose be given.

All bleeding will now have stopped, and a continuous suture of Japanese twist, with knots every two inches or so, will quickly complete the operation. A gauze drain is put into the axilla at the base of the axillary flap and left for forty-eight hours, and a sterile gauze dressing and wool and a bandage are applied, leaving the arm quite free. The skin will then adhere in the most favorable position for after-movements of the arm, for we must allow for contraction for this huge scar, especially about the axilla.

The author does not claim that this operation is complete or will always be certain to remove all the disease, but merely that it follows the rational plan. It is useless to follow with any hope of complete eradication infection along the penetrating branches to the intercostals or to the internal mammary, and it would be equally futile to go in pursuit of the disease along the channels accompanying the epigastric arteries or to the diaphragmatic or posterior mediastinal glands. If,

on account of involvement of the skin, a wide area would be left uncovered, skin-grafting should be done at the time of the operation. It is wise also to cut into the tumor first to make sure that it is malignant, and, if there is any doubt, to have a small part examined microscopically immediately, in order that unnecessary mutilation may be avoided.

CONTRIBUTIONS TO RENAL SURGERY.

The article of RUMPEL (*Archiv für klinische Chirurgie,* Band lxxxi, 2) consists of a series of case reports with comments. Various surgical conditions of the kidney are considered. The most important facts brought out in the discussion are the following:

A number of attempts have been made recently to disparage the value of the information obtained from the freezing point of the blood. These attacks exhibit a lack of understanding of the principle on which the method is based. A normal freezing point does not imply, as is assumed, that one kidney is normal, but merely that the two kidneys together are able to perform all that is required of them. If each kidney has half the necessary power, the total effect will be the same as if one kidney is entirely lost and the other possesses sufficient power for both. On the other hand, a freezing point below the normal does not imply that both kidneys are damaged. Various factors, such as imperfect cardiac action, pressure on the ureters, diseases of the blood, etc., may affect the concentration of the blood, apart from lesions of the kidney. This explains the good results obtained occasionally by the removal of a diseased kidney, when the freezing point of the blood shows incomplete excretory power. The comparative power of the two kidneys may be approximately ascertained by a comparison of the urine from each kidney. This is conclusive only when the urine is obtained by ureteral catheterism. The comparison of the total amount of urine excreted by each kidney is neither practical nor necessary, as the power of a kidney to keep the blood in a normal condition depends on its power to secrete a concentrated urine rather than on its power to secrete a large amount of water. It is not certain that the urine collected by the catheter ever represents the entire output of the kidney; some fluid may escape alongside it into the bladder. The aim of comparative cryoscopy is not to determine the actual excretory power of each kidney, but merely their relative power as compared to one another.

Before the performance of nephrectomy it is wise to determine the position of the kidney which is to be excised, and this can ordinarily be accomplished by passing a ureteral catheter into the pelvis of the kidney, and then studying its position with the *x*-ray. In some cases the catheter meets an obstruction near the kidney, and in this way the organ might be located too low. If the two ureters are catheterized simultaneously and the catheter pass in to the same distance, it may be assumed that each has reached the kidney. In case of doubt if a small amount of sterile salt solution is injected through the catheter it will cause pain if the pelvis has not been reached. Salt solution should also be injected if the urine does not flow freely, as the eye of the catheter may be obstructed.

The *x*-ray is also of value in the diagnosis of renal calculus. The composition of the stone is of less importance than a proper technique in obtaining positive results.

INJURIES OF THE SEMILUNAR CARTILAGES.

The mechanism of these injuries is considered by SCHULTZ (*Archiv für klinische Chirurgie,* Band lxxxi, 2), who points out the greater exposure to injury of the inner cartilage.

With the knee extended the inner cartilage is exposed directly under the skin for a space of three fingerbreaths. When the knee is flexed the patella slips outward, and the entire anterior surface of

the cartilage is exposed. The outer cartilage is also exposed in a spot near the patella, but is covered by a thicker fascia, and thus less liable to injury by direct violence. A comparatively light blow from a sharp object which strikes the cartilage exactly when the knee is flexed may tear it from its anterior insertion. Indirect injury is much more common, but requires for its occurrence that the knee be flexed and that the tibia and femur be pressed firmly together. The accident usually occurs in men bearing heavy loads. The tibia rotates outward when the knee is flexed, moving more on the inner than on the outer condyle, and thus putting the inner cartilage on more of a strain. If the flexed knee is suddenly bent inward, the strain on the inner cartilage is suddenly increased and it is likely to give way. If the knee is only partly flexed, the cartilage is forced outward against the lateral ligament, and may be entirely displaced. The reason that it is difficult to reproduce these injuries on the cadaver is incident to the lack of the muscular tension drawing the joint surfaces together.

TRANSPLANTATION OF SUPRARENAL GLANDS.

The loss of one adrenal gland has no effect on the health of dogs, and COENEN (*Archiv für klinische Chirurgie,* Band lxxxi, 2) tried to keep his animals alive by implanting one adrenal and later removing the other. He found that adrenal glands transplanted into the liver or kidney disappeared entirely in the course of a few weeks, in spite of the fact that they healed in place without difficulty. Glands or pieces of glands implanted in the spleen healed well, but in a few days began to show signs of necrosis. In from five to eight weeks the pieces had entirely disappeared, mere heaps of pigment granules showing where they had been. In all cases the removal of the second adrenal was followed by death. This occurred in most cases within twenty-four hours, in one case not until sixty hours. The author decides that it is not possible to obtain a functionating gland by transplantation of the adrenal.

DIAGNOSIS OF TUMORS OF THE MAXILLA.

The idea that empyema of the nasal accessory sinuses cannot cause dilatation of the bony walls is disproved by WOLFF (*Archiv für klinische Chirurgie,* Band lxxxi, 2) on the basis of several cases of such dilatation.

The improvements in the technique of removal of the upper jaw for malignant tumors have so reduced the mortality of the operation that surgeons are ready to resect the jaw as soon as the diagnosis of tumor is made. It is therefore very important that cases of empyema should be recognized as such and not resected as tumors. Hajek states that empyema of the maxillary sinus never leads to dilatation of its bony walls, but a small number of cases in which this occurred have been reported, and Wolff adds two more, in one of which the bone was resected and found to contain a mass of caseous matter entirely filling the maxillary sinus and causing a marked dilatation of its walls, simulating a tumor. He advises that in all cases of suspected tumor of the maxilla an exploratory puncture be made through the canine fossa with a cannula large enough to draw off even thickened pus. If the tumor has broken through the bone and become visible externally, this is, of course, unnecessary.

ENLARGEMENT OF THE TUBEROSITY OF THE TIBIA.

The condition described by JACOBSTHAL (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 5) is related to separation of the epiphysis. The tuberosity develops about the age of fourteen years, growing down from the epiphysis over the anterior surface of the tibia "like a tongue protruded from the mouth over the lip and chin." A special bony process grows out from the shaft, and unites with this "tongue" dur-

ing the fifteenth year. The entire process is not bony until about the twentieth year.

In boys at the adolescent period a sudden extension of the quadriceps may break the connection between the "tongue" and the underlying bone and turn it up. The same thing may occur by forced overflexion of the knee. The symptoms are pain and inability to extend the knee, followed by swelling and effusion of blood. In some cases the patella is drawn up to a higher point than its fellow. In most cases a groove can be felt along the lower surface of the tuberosity. A similar condition may appear without any trauma and on both sides of the body simultaneously. This seems to depend on a rarefying osteitis and ossifying periostitis. It is not certain whether it is an infectious osteitis or an interference with the process of ossification, related to late rachitis. Its tendency to be bilateral favors the latter view. The symptoms are pain and enlargement of the tuberosity, coming on slowly at the age of adolescence. If the symptoms justify it, the process may be removed by operation. Mild cases tend to spontaneous cure, as ossification advances.

STERILE CATGUT.

The exhaustive treatise of KUHN and ROESSLER (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 5) gives in detail all the methods which have been proposed for the disinfection and preparation of catgut, and the bacteriologic studies in connection with them. They describe in detail 89 methods, and conclude that it is impossible to sterilize the inner portion of a catgut thread without destroying it.

The only way to obtain unobjectionable catgut is to handle the gut cleanly from the time it is removed from the animal, and to disinfect each strip before it is rolled. They have devised a practicable method for doing this on a small scale, which is described in full. The gut after being washed and "slimed" and washed free from lye is placed in a solution of potassium iodide for several days, and then in a solution of iodine in the iodide. The strength of the solutions is still under experiment. For making silver gut, the strips are placed in a solution of almost any one of the organic silver salts for eight days, exposed to the light one day, and then rolled and dried. The bactericidal power of the various organic salts of silver is in almost exact proportion to the percentage of silver in each. The per cent of silver in the various salts is as follows: Collargol, 86.6; silver fluoride, 81.7; silver nitrate, 83.6; itrol, 61; actol, 51.5; argentol, 31; ichthargan, 27; argyrol, 20; albargin, 13.4; nargol, 9.6; largin, 9.4; novargan, 8; protargol, 7.4; argentamin, 6.4; argonin, 3.8. These percentages are from the authors' analyses and not from published figures.

IS THERE A FRACTURE OF THE SESAMOID BONE OF THE TOE?

The existence of pain and tenderness over the sesamoid bone of the great toe led MOMBURG (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 5) to suspect fracture and to examine the foot with the *x*-ray. He found, as he suspected, that the sesamoid bone was in two pieces, but on examining the other foot for comparison he found the same division there. The same condition was found in both feet in another case of injury, and led him to look the subject up.

Study of published radiograms showed that division of the bone on the tibial side was quite common, nine cases of double, three of triple, and one of quadruple division being found. Two cases of fracture of the sesamoid bone have been reported. In one the radiogram is not clear, in the other it is apparently a natural division. Neither was operated on. The pain is probably due to a traumatic arthritis, and disappears inside of two weeks. There is considerable danger of making a false diagnosis of fracture, if this anomaly is not taken into account. In all the cases examined the condition was bilateral, although in one case the tibial bone was divided on one side, the fibular on the other.

REVIEWS.

CLINICAL LECTURES ON NEURASTHENIA. By Thomas D. Saville, M.D., London. Third Edition, Revised and Enlarged. William Wood & Co., New York, 1907. Price $1.50.

Dr. Saville's lectures not only discuss the predisposing and direct causes of neurasthenia, but also the measures for treatment which in his experience have proved useful. The book is open to the objections which hold against any series of lectures which appear in book form. The remarks of the author are illustrated by the citation of a considerable number of cases which do not, we think, add materially to the value of the book, since the reading of case histories is not particularly interesting, and the reader always desires a concise statement of the views of the author rather than to have to form opinions of his own from reading reports of cases. That the book meets a need in presenting an important subject is evidenced by the fact that it has reached its third edition, and the author has taken the pains to carefully revise a number of the original lectures.

PROGRESSIVE MEDICINE. Volume II, June, 1907. Edited by H. A. Hare, M.D., Assisted by H. R. M. Landis, M.D. Price for four volumes in cloth, $9.00; in paper, $6.00. Lea Brothers & Co., Philadelphia, 1907.

The June issue of Progressive Medicine for this year opens with a valuable article upon hernia by Dr. William B. Coley, of New York, who is so well known as an authority upon this subject, and is followed by an article on the surgery of the abdomen by Dr. Edwin M. Foote, of the same city. Dr. Foote thoroughly covers the ground which has been developed during the past year, and considers especially the diagnosis of abdominal hemorrhage, the value of the blood count in sepsis, diffuse suppurative peritonitis, postoperative thrombosis, the surgery of displaced abdominal organs, and, perhaps more important than all, the question of when gastric ulcer becomes a surgical affection. He tells us that in about 80 per cent of the cases which occur in young women good results followed medical treatment, but that the remaining 20 per cent are turned over to the surgeon, who cures about half of them. Dr. John G. Clark in his article upon gynecology once more urges the profession to be on the lookout for the earliest symptoms of carcinoma uteri, and gives a number of suggestive symptoms which may be of value in early diagnosis. He also discusses the various forms of operative treatment of pelvic disorders. The article by Dr. Stengel upon diseases of the blood, dietetic and metabolic diseases, including diseases of the spleen, thyroid gland, and lymphatic system, is a complete summary of the literature of the past twelve months in this important field, with particular reference to the diagnosis and treatment of these infections.

BACTERIAL INFECTIONS OF THE DIGESTIVE TRACT. By C. A. Herter, M.D. The Macmillan Co., New York, 1907.

Dr. Herter's book, which deals not only with the common bacterial infections of the digestive tract but with the intoxications arising from them, is exceedingly timely and well prepared. Its appearance is of more than ordinary interest at the present time because this is a subject which has for a number of years engaged the attention of the medical profession, and about which there exists much difference of opinion. The well-known work of Bouchard, while interesting in a way, has not received the professional confidence which a book of this character should possess. So far as we know, there is no satisfactory presentation of this subject, except that of Dr. Herter, in the English language at the present time. Dr. Herter is so well known for his original investigations along the lines of physiological chemistry, and because he occupies the Chair of Pharmacology at Columbia College, that the opinions which he expresses may be regarded as authoritative and worthy of credence.

THE TREATMENT OF DISEASE. A Manual of Practical Medicine. By Reynold Webb Wilcox, M.D., LL.D. P. Blakiston's Son & Company, Philadelphia, 1907. Price $6.00.

Although this book is, from its title, apparently devoted to the sole consideration of therapeutic measures, as a matter of fact it is rather of the nature of a book upon practice, since in each case the etiology, pathology, symptoms, definition, prognosis, and diagnosis of diseases are considered. The therapeutic suggestions which are to be found in almost every page are up to date, and the most recent measures, many of which have not as yet received professional indorsement, are mentioned in numerous instances.

MATERIA MEDICA, THERAPEUTICS, PHARMACOLOGY, AND PHARMACOGNOSY. By William Schleif, Ph.G., M.D. Third Edition, Revised and Enlarged. Lea Brothers & Co., Philadelphia, 1907.

This is a small octavo volume of about 400 pages which has been revised by its author in such a way as to bring it up to date. It belongs to the "Medical Epitome Series" of Lea Brothers & Co., and is designed to afford a condensed yet comprehensive text-book and work of reference of Materia Medica. The classification used is that followed by Wood in his book on Therapeutics, although some of the methods of presenting the subject used by other authors are included. We are somewhat surprised that nothing is said under Chloroform in regard to acid intoxication or postanesthetic illness. The book is a useful one to the student who wishes to employ it side by side with some of the well-known larger text-books upon this subject.

A MANUAL OF THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE EYE. Second Edition, Revised and Enlarged. W. B. Saunders Co., Philadelphia, 1907. Price $2.50.

This duodecimo volume of 615 pages, 182 text illustrations, and two colored plates now appears in its second edition. Dr. Jackson is known as one of the most conscientious and careful ophthalmologists in this country. He has had a very large experience, first in Philadelphia, and in more recent years in Colorado, and is looked to as an authority on many questions which are of great interest to ophthalmic practitioners. The small size of this volume places it in the class of handbooks rather than in the class of text-books, but it is by no means so condensed that it cannot be employed as a text-book by undergraduate students and as a book of reference for practitioners, for whom we presume it has been chiefly prepared.

A LABORATORY MANUAL OF INVERTEBRATE ZOOLOGY. By Gilman A. Drew, Ph.D. Price $1.25. W. B. Saunders Co., Philadelphia, 1907.

This small manual has for its basis a set of laboratory directions prepared by members of the staff of instructors at the Marine Biological Laboratory at Woods Hole, Massachusetts, and represents not only the views of the author but of a number of other workers. As there are only about 180 pages of text in the volume, it is necessarily an exceedingly condensed manual, and in one sense somewhat in the nature of a primer. It is well suited for the purposes for which it has been prepared.

A MANUAL OF THE DISEASES OF THE NOSE, THROAT, AND EAR. By E. B. Gleason, M.D. W. B. Saunders Co., Philadelphia, 1907. Price $2.50.

This book, which appears in a flexible binding, is larger than the so-called quiz-compends, yet not as large as many of the more thorough works which deal with this subject. It is essentially practical, is well illustrated, and ranks, amongst the smaller books, as one of the best of its kind.

THE PRACTICE OF OBSTETRICS. Original Communications. By American Authors. Edited by Reuben Peterson, A.M., M.D. Illustrated. Lea Brothers & Co., Philadelphia, 1907.

This volume of over 1000 pages is made up of articles prepared by ten contributors who deal with the various aspects of obstetrics. It contains no less than 523 engravings and 30 full-size plates, and belongs to the Practitioners' Library, of which several volumes have already appeared from the presses of the publishers. The idea in the case of each volume has been to present a practical aspect of the subject with enough theory to make the application of practical advice correct and scientific. Many of the pictures are taken from the maternity attached to the Uni-

versity of Michigan. Among the well-known contributors we may mention Dr. Dorland of Philadelphia, Dr. Manton of Detroit, and Dr. Warthin of Ann Arbor.

It is a first-rate work for the practical obstetrician, and the book can be highly recommended, because it is one to which he can turn for competent advice presented in the form which can be readily utilized.

SELF-PROPELLED VEHICLES. By James E. Homans, A.M. Copiously Illustrated. The Audell Co., New York, 1907. Price $2.00.

As the title of this book indicates it is a practical treatise on the theory of construction, operation, care and management of all forms of automobiles, and it contains about 500 illustrations and diagrams giving the essential details of the construction and many important points on the successful operation of the various types of motor carriages driven by steam, gasoline, and electricity. The preliminary pages are devoted to an interesting historical review of the first self-propelled vehicles, and then follow 51 chapters which deal with all the details of automobile construction and running, describing particularly well-known forms of steam, gasoline, and electric motors. To those of our readers who not only wish to run motor cars but to thoroughly understand their mechanism, we can cordially recommend this book.

AMERICAN PRACTICE OF SURGERY. Complete in Eight Volumes. Volume III. Edited by Joseph D. Bryant, M.D., LL.D., and Albert H. Buck, M.D. New York: William Wood & Company, 1907.

The third volume of Bryant and Buck's Surgery is made up mainly of Diseases and Injuries of Bones and Joints, with a small section devoted to Poisoned Wounds and Rabies. Calmette's antivenene in doses of 10 to 20 cubic centimeters of the strongest serum is recommended in cobra poisoning. Calmette, who holds that the essential principle of all death-producing poisons is the same, says that his antivenene is effective against all sorts of snake-bites. Therefore, this is the remedy *par excellence* against rattlesnake poisoning, copperhead poisoning, or that of any of the venomous snakes.

In regard to tetanus, Mason holds that in the specific treatment tetanus antitoxin offers the best prospect of cure. He accords to it absolute powers as a prophylactic.

In the treatment of anthrax Sclavo's antianthrax serum is advised.

The section upon Fractures, contributed by Eve, embodies all that is modern, together with much of the teaching that has to a certain extent been superseded by improved methods of diagnosis. Nor is there that dependence upon operative means which modern methods and results justify. In dealing with fractures of the neck of the femur Senn's operation, long since abandoned, is elaborately described, and more modern and satisfactory methods are not even mentioned. And to the Parkhill plates has been accorded a place which should have been given to direct suture or plating.

Roswell Park contributes an extremely interesting chapter upon non-inflammatory affections of the bone, including under this head osteitis deformans and rickets. A brief but satisfactory chapter on Syphilitic Disease of the Bone is contributed by Shelton Horsley.

The chapter on non-tuberculous and non-traumatic affections is discussed by Painter, and he has traversed this difficult section extremely well. Much space has been devoted to tuberculous disease of the joints by Primrose. He has embodied in his article the current teachings found in the orthopedic text-book.

It may be said of this volume, as of its predecessors, that it is a most excellent piece of book-making, essentially practical in its teaching, and likely to be particularly serviceable to the general clinician who in the course of his work sees many surgical patients.

MODERN SURGERY, GENERAL AND OPERATIVE. By John Chalmers Da Costa, M.D. Fifth Edition, Revised and Enlarged. Illustrated. W. B. Saunders Co., Philadelphia and London, 1907.

This fifth edition of Da Costa's book is but an added proof of the well-merited appreciation with which the work has been received by the profession. It is to be noted that the author's thorough familiarity with current literature has enabled him to add to his work practically all that is of value in recent writings. Thus will be found

descriptions of the Matas operation for aneurism, the treatment of peritonitis by incision and drainage in the semierect position, Szadek's method of filling bone cavities, the Quénu operation for rectal cancer, Willy Meyer's operation for carcinoma of the mammary gland.

The book can be commended without reservation, and is likely to remain a leading text-book on this subject.

THE ABDOMINAL AND PELVIC BRAIN WITH AUTOMATIC VISCERAL GANGLIA. By Byron Robinson, B.S., M.D. Frank S. Betz, Hammond, Ind., 1907.

This book suggests to the reviewer the thought that the publisher was so assured of the value of his subject-matter that he considered its proper dressing of minor importance. The profession as a whole is familiar with Byron Robinson's scholarly exposition of his often original conceptions of anatomy and of surgical therapeutics; to such they need no beautifying form. To others the binding, print, and paper are not likely to prove alluring.

SURGICAL DIAGNOSIS. By Daniel N. Eisendrath, A.B., M.D. Illustrated. W. B. Saunders Co., Philadelphia and London, 1907.

This book, copiously and admirably illustrated and printed in large, clear type, approaches the question of diagnosis from the clinical standpoint, grouping the injuries and diseases in the manner in which the general practitioner or the surgeon must consider them when he examines a patient for the purpose of making a diagnosis. Thus in the chapter upon Injuries of the Head the various traumatic lesions of the scalp, skull, and brain are considered together. The text throughout is characterized by a clear conception of the value and bearing of major symptoms, a careful consideration of the question of differential diagnosis, a frank acknowledgment of the difficulties often attendant upon this, and an absence of overloading with minor and confusing symptoms which often tend to produce in the student's mind a hopeless confusion. This book is a distinctly valuable addition to surgical literature.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D., F.R.C.P.

In the obituary of the month there should figure a long list of London medical societies which have now passed away; many full of years and honors, but very few full of riches. Valedictory addresses were delivered, and the obsequies performed with all ceremony and decency, but none the less there is something of sadness in the thought that societies which have been famous in the medical world for many years—some for a quarter of a century, one for over half a century, and one for more than a century—have during the past month breathed their last and passed away forever. No less than fifteen societies have just ceased to exist as separate bodies and have been amalgamated to form the Royal Society of Medicine, which was inaugurated this month by a meeting at 20 Hanover Square, the home of the former Royal Medical and Chirurgical Society, which as being one of the oldest and the most prosperous of the societies was the natural promoter and patron of the scheme. It must be many years since such a meeting of the leading members of the profession has assembled in the room or hall at Hanover Square; many found standing-room with difficulty, and a long queue awaited entry in the passage leading to the hall.

Mr. Warrington Haward, as president of the late Medico-Chirurgical Society, took the chair, and a formal resolution for the amalgamation of the fifteen societies was moved by Sir Richard Douglas Powell, the president of the Royal College of Physicians, and seconded by Mr. Henry Morris, the president of the Royal College of Surgeons. Both referred in tones of highest appreciation to the devoted labors of Sir William Church, former president of the Royal College of Physicians, to whose tact

and perseverance the amalgamation was largely due. The king had graciously granted a charter for the new Royal Society, and the acceptance of this was moved by Sir William Church. An important item in the business was the election of the first president of the Royal Society of Medicine, and on the motion of Sir Thomas Smith, seconded by Professor Osler, Sir William Church was unanimously elected, and it was generally felt that no better occupant for the presidential chair could have been found, for Sir William Church, as Professor Osler said, "is that rare bird in the medical profession," not only a distinguished physician but a man of business, and indeed his tall and commanding presence, together with his courtesy and justness, gives him a dignity which adorns a presidential office. As he took the chair now vacated by Mr. Warrington Haward, the latter formally handed him the master-key of the building which is to be the home of the new society.

And so the inaugural meeting ended, and the Royal Society of Medicine entered upon its career, which should do much to advance medical science in this country. It will have a library consisting chiefly of that which belonged to the Medico-Chirurgical Society, but with additions no doubt from the incorporated societies, making the finest medical library in this country next to, if indeed not equally with, the library of the Royal College of Surgeons, and offering the great advantage that books may be taken out under certain conditions. The name of the new society is somewhat unfortunate, for it must lead to obvious confusion in speech: there exists already a Royal Society the Fellowship of which is regarded as the highest scientific honor obtainable in this country. It is obvious that unless the full name of the new society is given each time it is mentioned, its Fellowship might be mistaken for the coveted F. R. S.; indeed, it was evident in the president's opening speech that he labored under this difficulty, for at times he corrected himself as he was about to speak of the "Royal Society," a term which is the more ambiguous here, for many of the Fellows of this new organization are really Fellows of the Royal Society, and papers read before the sections of this new society will sometimes deal with matter which is being brought before the Royal Society proper.

Whilst, however, some societies have died, new ones are being born; I mentioned only last month the Association of Physicians of Great Britain and Ireland. Now another has sprung into being, a "Society of Tropical Medicine and Hygiene," with Sir Patrick Manson for its first president, and Prof. R. Ross for its vice-president.

At St. Mary's Hospital recently Dr. Lees, whose term of office as physician there has just expired, delivered a most interesting farewell address, in which he mentioned some of the many advances in treatment which he has himself brought about in the past twenty years. He pleaded eloquently for more careful percussion of the heart; he said that it was failure of the right side and not of the left which was the common cause of death in pneumonia; a large proportion of the enormous number of fatal cases of pneumonia each year might be saved if the doctor would take pains to percuss out the right margin of the heart properly, and if he found it enlarged, would bleed or leech. A patient with a distended bladder is thought to require immediate relief; a patient with so dangerous a condition as an overdistended right heart, equally easy of relief, is left to take his chance because the practitioner's percussion is inadequate and bleeding is out of fashion. The value of the ice-bag in pneumonia was also emphasized, and Dr. Lees said he is satisfied that its good effect is due to a bactericidal influence, depending upon the inhibition of bacterial growth by a low temperature. He declared his conviction also that the micrococcus described by Drs. Poynton and Paine as the cause of rheumatism is no chance contamination, but is as constantly present in rheumatism as the pneumococcus is in pneumonia. Passing on to the treatment of pulmonary tuberculosis, he said that during the past two or three years he had treated all his cases of this disease with continuous inhalations by means of a Yeo's respirator, on which was placed a mixture of carbolic acid, creosote,

iodine, alcohol, ether, and chloroform. The inhaler is worn day and night, and removed only at meal-times. Six or eight drops of the mixture are dropped on the sponge of the inhaler, every hour while the patient is awake, and several times during the night. This rapidly relieves cough, and patients seem to derive great benefit from its use. Dr. Lees closed his address with a comparison of the good results which medical treatment can obtain in acute bacterial invasions with the disappointing failure of the most modern methods of therapeutic inoculation in these diseases—a necessary encouragement in these days of pessimism and skepticism as to the value of the drugs and methods which we have used so long.

At the final meeting of the Pathological Society of London, which took place this month, the president, Dr. Pye Smith, delivered an address which took the form of a historical review of the society since its inception in 1846. The first president was Dr. C. J. B. Williams, a pupil of Laennec, and since his time amongst the list of presidents there have been such distinguished men as Sir Thomas Watson, Sir Richard Quain, John Hilton, the author of the famous work on "Rest and Pain," Sir William Jenner, Dr. Murchison, Sir James Paget, Sir George Humphry, and quite recently the late Sir John Burdon Sanderson, not to mention some of those still living—for instance, Sir Samuel Wilks, Mr. Jonathan Hutchinson, and Dr. Pavy. Surely one may be forgiven for grieving over the death of a society to which so many earnest and distinguished workers have given some of their best labors.

At the Royal Institute of Public Health the Harben Lecture this year was delivered by Professor Ehrlich on some experimental researches in therapeutics. A reception was also held by the president and Council of the Institute the next day, when a large assembly gathered to meet Professor Ehrlich and his wife. Dr. Wynter Blyth, who is well known as a writer on foods and food analysis and upon the detection of poisons, has just retired from the post of medical officer of health to the Marylebone district of London, an appointment which he has held for thirty years. The death of Dr. Julius Dreschfeld, of Manchester, removes from the profession in this country a very distinguished physician. He was Lecturer on Pathology and subsequently Professor of Medicine at the Victoria University. Born in Bavaria, he knew scarcely any English when he first came to Manchester, but such was his genius and perseverance, and such is the appreciation of all true worth from whatever land it may come in this country, that Professor Dreschfeld attained a foremost position in medicine in the land of his adoption.

NOTES AND QUERIES.

ELEMENTS OF A SUCCESSFUL CAREER.

The dangers which attend professional life are many. The road to honor and success has many pitfalls which are at times difficult to see and avoid. At the very beginning of his career the young professional man should definitely settle a few things, such as what is to be his chief aim and what his standard of success. The author suggests for adoption three general principles or rules for guidance in professional life. The first concerns the attitude the physician takes toward his work; the second, his relations to his patients; the third, his relations to his colleagues in medicine.

Love Your Work.—The physician's attitude of mind toward his work goes far to determine his enjoyment of it. His cares are many and his responsibilities great; the drudgery of his work soon becomes wearisome, unless in all and through all he can keep his scientific interest in his profession. He must love his work if he would succeed in it. He may not retain through life all of his early enthusiasm, but as long as he lives he should be a student of medicine. It is only this interest, coupled with the thought that he is

rendering helpful service, which lifts the practice of medicine above the treadmill of routine and brings genuine satisfaction and happiness in the midst of arduous labor.

Serve Your Patients.—The rule which should govern a physician's relation to his patient, although at times difficult of application, may be stated in a few words. He should always act in the best interest of his patient. Under no circumstances should he allow self-interest, expediency, or, in fact, any other motive, to influence his judgment or his action. The principle once accepted, he can seldom go wrong; but if a firm stand is not taken at the outset, and if other considerations are permitted to weigh in his mind, little by little he may come to lower his ethical standards until he finds himself drifting in dangerous waters, where shipwreck is only a question of time or circumstance.

Treat Your Professional Brethren Generously.—The rules by which the relations of a physician to other members of his profession should be determined have been in the past a subject of much discussion. At different times various codes have been drawn up which have attempted to formulate proper rules of conduct. The relationships of physicians to one another may be and often are among the most delightful known, whether they meet in association for scientific discussion or as fellow-workers in the great cause of helping humanity. They form a sort of guild or brotherhood all over the civilized world. There is among them a sympathy, a spirit of fraternalism, which all who have known it must pronounce as one of the greatest joys of life. Such the physician's relations may be; everywhere such they have always been among the great souls of the profession.

But it is humiliating to admit that, owing possibly to the very personal character of the competition in the practice of medicine, the feeling of rivalry between physicians too often predominates over every other sentiment. Even without deliberately intending to do so they readily yield to the temptation, by unkindly and unfraternal criticism, to undermine the influence and to injure the reputation of their colleagues. In smaller places particularly, where each man works most of the time by himself, the petty jealousies of physicians are very common, but most undignified and unworthy.

Nothing does so much to weaken the influence of the profession as this spirit. The public has no patience or sympathy with it. If the physician's outlook were a larger one, his interest in science greater, this could not endure. He should cultivate a liberal attitude, and, conscious of his own mistakes, be charitable toward those of his fellows. This generous spirit always begets generosity; while the man who always stands on his dignity, ever watchful lest his rights are encroached on, finds himself with a grievance most of the time. In all intercourse with others of his profession there is only one rule for the physician's guidance, viz., to act toward them as he would wish them to act toward him.

CONCLUSION.

The author has pointed out some of the tendencies and alluded to some of the dangers which to-day threaten medicine as a profession. Its future glory or shame rests largely with you who are the students of to-day. See to it that you always stand for the dignity and honor of your profession. If the physician's life is a strenuous one, its rewards are many and are within the reach of every one who with diligence and unselfishness will seek to serve his generation. It is the law of the moral universe that there are no short cuts to knowledge, no such thing as ready-made experience, and no counterfeit for character. Real and lasting success rests now, as always, on honest work and personal worth; or, as Lowell has put it,

> God's price is high, but nothing else
> Than what He sells, wears long.

—HOLT, in the *Journal of the American Medical Association*, March 9, 1907.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series. Vol. XXXI. | DETROIT, MICH., SEPTEMBER 15, 1907. | Third Series. Vol. XXIII, No. 9.

ORIGINAL COMMUNICATIONS.

PROPHYLACTIC MEASURES GUARDING AGAINST THE DEVELOPMENT OF LANDAU CASES OF VISCEROPTOSIS.

BY ANTHONY BASSLER, M.D.,

Visiting Physician to St. Mark's Hospital Clinic, New York, etc.

Pregnancy is a factor of importance in the production of Glénard's disease, which really is more of a condition than strictly a disease. Of itself, pregnancy and the resulting states of the abdomen therefrom is not sufficient to actually cause the production of the entire picture of abdominal viscera prolapse with symptoms. These cases are usually preceded, before pregnancy, by a more or less prolapsed state of organs and a more or less state of debility or disturbed nutrition due to constitutional or local causes. Then with the presence of a tendency to further prolapse, pregnancy is often the factor in the development of subjective symptoms in organs which before this had carried on their functions satisfactorily, and without knowledge to the patient that anything had been radically wrong in the abdomen. These cases are called the Landau cases, because first described by him. To the extent of the commonness of these cases (they make up a large bulk of the abdominal cases in women in our clinics to-day) enough attention to the remote aftermaths of pregnancy is not given by the average accoucheur in charge of his labor cases, upon whom after all, in addition to his midwifely duties and surgical attentions in the case, rests also the responsibility of the mother's complete after health in so far as all bad legacies from her pregnancy are concerned. My observation, from a gastroenterological standpoint, has convinced me that with the addition of a few logical rules to the postpartum care of the mother, all of which are easily carried out by the patient herself, much good could be done and the number of these cases made perceptibly fewer.

It requires more than simply a relaxed condition of the abdominal parietes, *per se,* in Landau splanchnoptosis, to account for ptosis with symptoms, and while, with proper sustaining support to the abdomen, these cases are manifestly improved, still we are treating with only one part of a state complex, to which the pendulous abdomen is only a concomitant. The study of ptosis, in men and in nulliparous women, exhibits too often a predisposing heredity (the neurotic, neurasthenic, and alcoholic parents being fruitful progenitors); a poorly nourished and rachitic infancy and childhood; too little of God's sunshine and fresh air in the formative and early adolescent years of life (for it requires about two thousand cubic feet of air to pass through an adult's lungs daily to furnish sufficient oxygen to maintain good digestion and nutrition); some long-standing improper habit in the quality and quantity of foods, regularity of eating time, prepara-

FIG. 1.—Clinic case of Landau. Mrs. A. M., 28 years old. Family history negative. Personal history good, in so far as digestive organs are concerned. Bowels had always moved daily before labor. Primipara, delivered by midwife December 12, 1906. Labor normal. Child weighed 8 pounds. Bandaged indifferently for one week, not afterward. At her domestic duties on the tenth day. Symptoms of illness came on two months after delivery. Photo shows the concavity of the abdomen above the umbilicus and the bulging of the lower zones. There was but little contractile and sustaining power in the walls above the navel. Below the navel the contraction was more pronounced. She had very poor control over the musculature of the abdomen. When examined three months after delivery she had marked gastric stagnation with accompanying symptoms. Bowels strongly constipated. Had constant pain in the back and right iliac region; was unable to work, and had to rest on her back most of the time to get relief. She was practically an invalid.

tion of food or its proper mastication; or some general constitutional debilitated state of health, from whatever cause, to accept relaxation of the abdominal walls as other than a concomitant rather than a primary cause of ptosis. Still I feel that in post-puerperal cases this order may be somewhat reversed by there being left an overdegree of flaccid, stretched-out, and weak walls, a parietal subinvolution if you please, encouraging further descent of the viscera within and the development of symptoms by the breaking down of the prior state of existent digestive compensation, as the accompanying case (see Figs. 1 and 2) plainly shows.

The gravid uterus at term occupies practically all of the possible space in the abdominal cavity, particularly in the prone position. It reaches superiorly close to the under surface of the liver, and in breadth almost to the limits of the lateral confines of the abdomen. In the upright position the intestines are posterior to the uterus; in the dorsal position they lie chiefly to the sides, but partly too in front of the uterus. In the upright position the uterus in advanced pregnancy rests upon the anterior abdominal walls, the component tissues of which are immensely stretched and somewhat thinned. The fasciculi of the recti and side muscles increase in length, slightly in thickness, but not in numbers. The joining borders of the recti, especially below the umbilicus, separate, causing a weak space in the fore

FIG. 2.—Same case, showing the degree of descent of the stomach, colon, liver, and right kidney.

wall of the abdomen, which persists more or less after the delivery.

In even the most favored cases a certain degree of relaxation of the abdominal parietes, with some accompanying degree of ptosis, persists after a pregnancy. In a strong, well-nourished woman this goes on without the development of any subjective symptoms and may be considered physiological. But under less favorable conditions there is always a danger, in some women, of the loss of sufficient sustaining power of the walls, persistently encouraging still more descent of the organs within. The recti are the big factors in this, the lower segments of which muscles are usually found bulged forward and the upper segments loose and flaccid. Thus here we often see the mechanical element of cause found in these cases.

Another basic cause in Landau cases, as well as in all cases of ptosis, is subnutrition. The pressure of the gravid uterus on the digestive organs gives rise to many functional disturbances. There is diminished intestinal activity affecting the digestion of food, and being more commonly the cause of constipation than obstructive pressure of the uterus. The blood changes incident to pregnancy may also affect the nutrition unfavorably. In the early months there is a hydremic condition of the blood, and it is always questionable if the enriching of the blood in advanced pregnancy, in hemoglobin and total number of red blood cells, is equal to the greater demands that are made upon them. There is generally more or less vomiting and gastric disturbance, due to spasmodic contractions of the stomach and diaphragm. The vomiting may be severe and persistent enough to keep the woman under-nourished for some time. The vital capacity of the lungs is diminished, interfering with the proper oxygenation of the blood. The taste and smell are often affected, so that there may be repugnance for foods of the best kind, and there is often found insatiable demands for foods of a low nutritive value. To all these there may be added a length of intoxication of the body due to the pregnancy and more or less impairment of the renal function. And lastly, to the mechanical and nutritional changes are added the nervous ones, making complete the great triumvirate so often seen in cases of abdominal visceroptosis. The nervous system during pregnancy becomes impressionable, so much so that in some women already so predisposed it may terminate even in insanity, and how simple it is to understand that the great factor of neurosis in digestive disturbances could easily make its beginning here.

It is interesting to observe that in the histories of 86 clinic cases of women who had been pregnant which have come under my personal observation for continued treatment for some digestive disorder, in 21 of them a resulting state from pregnancy was believed to be the weight that threw over their former balance of health. Of these 21 cases, 15 were primiparas and 6 were multiparas. Of the 15 primiparas, the average age of which at the time of their delivery was twenty-two years, the average length of time for the development of subjective symptoms was 5½ months after parturition. Taking the single-child cases, for they are the best for the point of this paper, they were all cases of plainly evident visceroptosis of one or more of the abdominal organs, combined with various disorders of motor, secretory, and sensory origin. They were all examined by the usual methods, such as external physical measures, test meals, lavage of the jejunum, inflation, transillumination, and *x*-ray, and all but two improved under the accepted modern methods of therapy for gastroptosis, using that term in its broadest sense.

Questioning these women closely, I have learned that the advances which the study of digestive disorders has made in late years have added but little to the common practice of obstetricians to-day above ten years ago, particularly those who practice among the poorer class of people. In my

opinion none of these women had been watched long enough or closely enough to guard against the dangerous aftermaths of their pregnancy. One woman wore an abdominal support for six weeks after her labor, but she did this because she found it most helpful to her, and even against the advice of her physician; the rest practically not at all after the first few days. As far as I was able to learn, the usual practice of the attendants, in so far as the abdomen was concerned, in an uncomplicated postpartum after the first three days of fluid diet, was the giving of a purge, a most excellent practice, followed by the more substantial diet. There were two or three quick examinations of the abdomen to observe the downward course of the fundus uteri. When this was no longer felt above the symphysis pubis, and the lochia had ceased to be sanguineous in character, the patient was permitted to leave her bed, at which time the attendant usually concluded his visits to the woman, whom he might not again see for months afterward. Is this all that is expected of us as physicians? Our clinics have proved otherwise.

An abdominal cavity that has been subjected to a rising internal pressure for months, when suddenly collapsed, from whatever the cause, suffers a shock. What other explanation can be given to the chill immediately following delivery? Then come the long days of slow return of the walls and their contents to the normal condition. In this light where is contained the wisdom, in the growing custom of late years, in advising against the use of the old-fashioned binder after delivery, which did so well in equalizing the lowered intra-abdominal pressure by its support to the walls? The only reason I have been able to obtain for this change in practice is that a tight-fitting bandage is liable to malpose the uterus and thereby possibly favor the establishment of some permanent malposition of this organ, or that the binder was very liable to be soiled and therefore uncleanly and unsurgical. The first is about as absurd as the second is indicative of neglect. It is true that at our postpartum visits the binder is usually found loose and above the iliac crests; but is not this due to carelessness on our part in failing to instruct the nurse how to properly apply the bandage? That it is an uncomfortable appliance to the woman is not borne out by her statements, who if anything gladly welcomes the support that it gives even to the very end of resolution, which in a normal case usually takes about six weeks' time. And the last prop is knocked from under the argument when it is contended that it is too warm and distressing a thing for his patient to keep on in summer, when the thinnest skirt she ordinarily wears is not any cooler.

As soon after delivery as possible, in all cases, a bandage should be put on. It should be wide enough so as to extend from the middle third of the thigh to the ensiform process. It should be shaped to the abdomen by being tucked at the sides from above downward, and be boned in the back, at the sides, and in front so that it stays in place. At intervals during the postpartum the abdominal wall should be examined to note its muscular power, its tone, and general condition. This is best done while the patient makes efforts at straining as if at stool. Attention should be paid that the bowels move freely and that gases are not permitted to accumulate in quantity. The bandaging should be kept up for at least two months after delivery, and for four or six months in cases in which the abdomen is inclined to remain loose and pendulous. After she is about an elastic belt may be used instead of the muslin bandage, which is not so comfortable for locomotion. When there is a danger of ptosis, a strong, well-fitting belt should be worn; one such as the kind I ordinarily use in Glénard's disease is good. This belt possesses an advantage over others in that in addition to its support to the abdomen it raises the lower abdomen upward as well as backward, by

the use of what may be called an artificial mesentery, an elastic strap which tends to approximate the lowest point of the belt in front to the highest point of the belt in the rear. This strap is adjustable to different degrees of tension. The belt as a support from without neutralizes the further baneful *vis a tergo* of the sagging viscera within, this contention is not well taken. If any effect is seen by its continued use it is one of added tone and benefit. I am not averse to a belt being

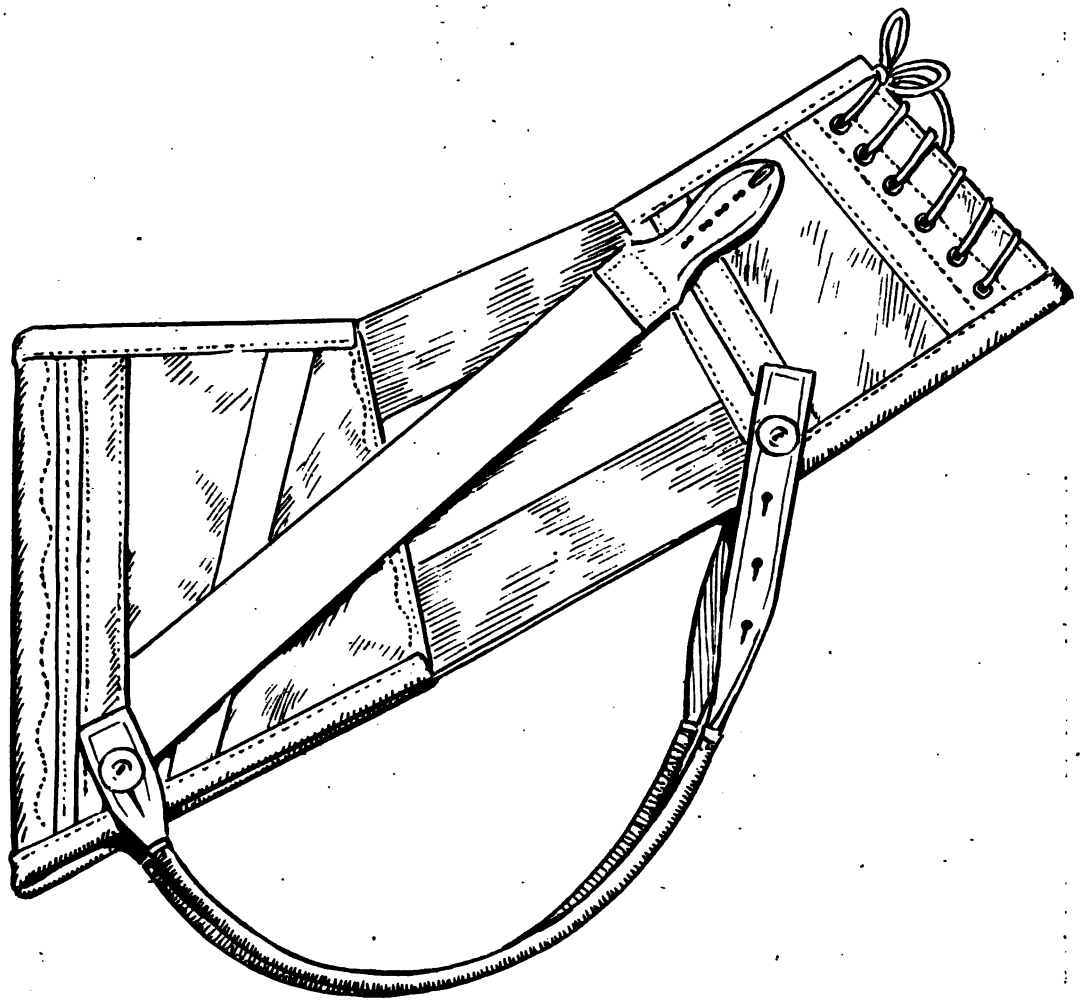

FIG. 3.—Author's belt, showing mesenteric strap in position. The body of the belt is constructed so as to take a very low purchase in front and the highest possible point in the rear, which is generally gauged by having the top of the back of the belt fit well into the waist line. The front and back are made of inelastic material; the mesenteric strap and side are made of elastic webbing. The body of the belt must fit snugly and evenly with the perineal straps (which are indispensable), just taut enough to keep the belt from riding.

itself is especially constructed to take this low and high position, as shown in Fig. 3. There are some who contend that an abdomen so supported for a length of time loses its tone and afterward becomes dependent upon such support. But as the bandage or belt does not interfere with the action of the abdominal muscles, and worn for six months after delivery in all slim women.

At such times as it is deemed advisable, efforts should be made, in all postpartum women, particularly where there is danger of a pendulous abdomen, to strengthen the muscles by exercises, the most valuable of which is for the patient to make, often dur-

ing the day, voluntary contractions of the abdomen as a whole. While difficult at first with most women, the art of doing this is soon acquired. The patient's attention should be directed to the lower abdominal zone, and she should try to flatten, by a slow, strong, and deliberate effort, all of the abdomen below the navel. They all soon get control of the lower segments of the recti, etc. This exercise can easily be carried on in bed, and should be kept up for several weeks at least. The only other exercise possible while in bed is the raising of the body to a sitting position. To do this properly the lower extremities should be held down. When she is about, this is best done by the woman putting her feet under some piece of furniture, raising herself from the floor with her arms extended over her head. The third best exercise is the raising of the lower extremities, back on the floor, in stout women, to the vertical position; in slim women the toes may be made to touch the floor over the shoulders. The fourth and fifth movements are carried on while standing with heels together. They consist of a rocking motion down from side to side and a twisting motion of the trunk, first one shoulder forward, then the other. In loose clothing these movements should be carried out mornings before the belt is put on, and evenings after it is taken off for the night. In imminent cases they are very valuable measures and should be insisted upon strongly. Figs. 4 and 5 show the best and the poorest results, configura-

FIG. 4.—A private case, showing the development of the abdominal muscles from exercise. E. L., aged 26 years. Primipara. Delivered August 1, 1906. Normal labor of eleven hours; slight perineal laceration; child weighed 7¼ pounds. Kept up her exercises for five months after delivery; gained 10½ pounds. Photo taken 7½ months after confinement.

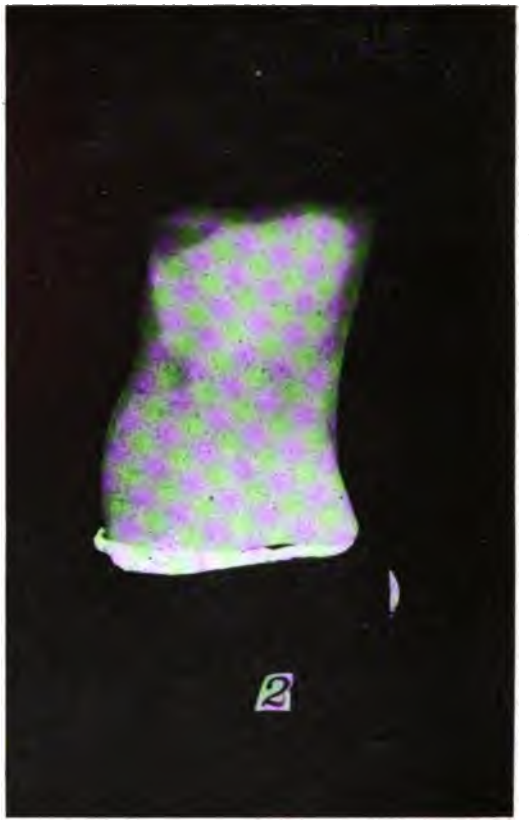

FIG. 5.—Private casethat showed the poorest abdomen and the least gain in weight. Primipara, 27 years old. Delivered January 8, 1907. Infant weighed 7¼ pounds. In labor three hours. Photo taken three months after delivery, showing the long, narrow abdomen with still good configuration. Woman perfectly well. Discarded the bandage, but still exercising.

tively speaking, of the abdomens of the women who exercised.

Abdominal massage, electricity, and hydropathic measures, I merely mention as not deserving of much attention in the routine of these cases.

In all cases of women who have been delivered, and for many weeks afterward, the diet should be of the highest nutritive value and pushed to the very limit of digestive capacity. The meals should be small in bulk and frequent. Food every three hours is not any too often in an imminent case. When the patient is about, and taking her three meals a day, supplemental meals of milk, eggs, bread, butter, and so on should be advised. When the danger of ptosis is great the giving of much fluid should be guarded against. The choice of food should be liberal; it is often wise to disregard any mild dyspeptic disturbance and feed the woman generally as well as generously, or she runs the danger of being underfed. It is best to lay out a plan of diet, with the quantities, and insist upon her meeting it. The main purpose of the diet is to add rapidly to her weight. The carbohydrates are strong factors in this. This forced feeding is also of value to nursing women and in the anemic and poorly developed.

It is often beneficial to make the mistake of keeping the woman in bed too long. She should be encouraged to rest after her heavy meals for some time, and warned against any fatiguing or violent efforts for two months. In cases in which the abdomen remains pendulous, and the walls are weak, it is wise to advise a morning and afternoon rest of two hours, with the buttocks raised so as to have the viscera gain a higher level in the abdomen. Another good plan is to have her sleep for some weeks in a bed raised at the foot end.

In the past fifteen months I have interested myself in thirteen first-baby cases, in all of which the above plans were carried out. Up to the present time none of these women have had any significant digestive disturbance, and in all of them their abdominal walls are in fine condition. Their gains in weight ranged from seven to thirty-one pounds; none failed in showing some gain. Of the seven who may be classed as neurotics, in six their nervous condition had been much benefited by the rest and diet. Three of them were tubercular and one probably syphilitic; they also were better in health than they had been before their pregnancy. Seven of them were in slim women, four of whom were distinctly of the long, narrow thorax and abdomen type, in whom visceroptosis is so common. Still none developed any digestive trouble whatsoever. All but one nursed her infant. In only two of the cases could I feel sure that the lower as well as the upper curvature of the stomach

FIG. 6. — Private case that showed the highest gain in weight. A. W., 27 years old. Primipara. Delivered November 17, 1906. Child weighed 10¼ pounds. In active labor twenty-one hours. Troubled with nervous indigestion before her pregnancy, not since. Weighed March 2, 1906, 129 pounds; three months after delivery weighed 160 pounds. Perfect result. Nursed her child and claims she never before felt so well.

showed any definite descent, and in these, after repeated examinations with test meals, the Leube as well as the Ewald, they did not show any abnormal retention of food in their stomachs. The average line of configuration of the abdomens in my cases, as well as the tonic condition of the musculature of the walls and the general condition of these women, compared strikingly with the clinic cases that I saw. I don't doubt that with successive pregnancies these abdomens may not remain in as good condition as they are to-day. But at this time I feel that their efforts have not been in vain, since all of them claim to be perfectly well and better physically than they had been before their pregnancy, and I believe that the benefits were the logical results of these prophylactic measures against ptosis, which they had carried out during their first months after delivery.

A SUMMARY OF CERTAIN FORMS OF SURGICAL PRACTICE (FROM THE SAMARITAN HOSPITAL SERVICE).[1]

BY W. WAYNE BABCOCK, M.D.,

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Instead of a formal paper upon a single subject in surgery, it is purposed to present in brief résumé a number of matters that have proved of especial interest in the surgical service of the Samaritan Hospital. The communication will, therefore, be in the nature of a report of certain forms of surgical practice: either indicating our present attitude toward the further application of principles previously more or less well understood, reiterating methods which apparently have not received sufficient acceptance or appreciation by the profession, or describing novelties in surgery, operative measures that have been evolved in the routine of hospital work. In any case the limited time at our disposal precludes anything but a brief summary of any special subject, but it is trusted that points which through haste are not clearly explained may be rendered plain during the discussion.

General Surgical Anesthesia.—Ethyl chloride has not been generally adopted either for short operations or as a preliminary to ether narcosis; our slight experience corroborating that of others, that this anesthetic is as dangerous as, if not more dangerous than, chloroform. The nitrous-oxide-ether sequence is preferable and has much to commend it from its relative safety.

Of the general anesthetics exceptional attention has been paid to scopolamine-morphine. At first a clinical study of various narcotics and delirifacient alkaloids was made, these alkaloids being used for a month almost to the complete exclusion of ether and chloroform for operations upon nearly every part of the body, in persons of various ages and temperaments. In this way we soon obtained some working knowledge as to the sphere of action of drugs used for narcotic anesthesia. The most useful alkaloids were found to be scopolamine, hyoscine, and possibly daturine, used in combination with morphine and apomorphine. Discrepancies in the results obtained we at first attributed to variations in the activities in the alkaloids employed; but a more extended experience showed us that age, condition, and personal idiosyncrasy were the most potent factors in influencing the results. In general, slightly less than one-third of our patients were found sufficiently susceptible to scopolamine-morphine narcosis to enable the operation to be

[1]Read at "Samaritan Hospital Night," Northwest Branch, Philadelphia County Medical Society, March 7, 1907.

satisfactorily done without recourse to other anesthetic. Having had the method under trial almost continually since 1905 we are now able, by selecting our cases, to employ narcotic anesthesia with sureness and satisfaction, as experience has taught us the types of patients in which this anesthetic is not appropriate. Our conclusions are:

1. That narcotic anesthesia is usually unsatisfactory in robust persons under thirty.

2. In neurotic or hysterical young women unconsciousness is often difficult to produce and anesthesia is unsatisfactory.

3. In abdominal operations, except in patients with greatly relaxed or distended abdominal walls, scopolamine is objectionable as it produces spasm of the recti muscles.

4. Narcotic anesthesia is least suited to operations upon the extremities, the fingers and toes seeming to be among the last parts of the body to become insensitive. It is likewise not well suited to operations about the perineum and anus.

We select our cases for narcotic anesthesia from:

First, persons of middle or advanced age. Persons over fifty are almost uniformly susceptible to narcotic anesthesia.

Second, patients with chronic debility and asthenia; even young hysterical persons if suffering from forms of chronic debility may be very susceptible to scopolamine-morphine.

Third, patients with deficient eliminative functions, with toxemia, or with a tendency to uremia or cholemia, or those with degenerative disease of the central nervous system. These patients may be particularly sensitive, and in them the dangers of narcotic as contrasted with the dangers from other forms of anesthesia must carefully be weighed. If scopolamine be used the dosage should be smaller than usual and the induction of the narcosis very carefully supervised. Although we have had no deaths that could be attributed to scopolamine-morphine alone, twice have we seen the respiratory rate fall in such patients to three or four per minute, from which, however, the patients emerged without mishap.

Fourth, site of operation. Narcotic anesthesia shows its predominant analgesia upon the scalp, skull, face, and upper respiratory passages and neck, which fortunately are the very parts of the body in which inhalation anesthesia is most objectionable. In operations upon the mouth, nose, or upper pharynx it has a further advantage, that the reflexes are usually preserved, and thus the mouth is not only dry and free from mucus, but blood or other fluids gravitating into the pharynx are promptly swallowed instead of being aspirated into the larynx. In operations upon the larynx or trachea, such as laryngotomy or laryngectomy, the reflexes become objectionable from the constant cough produced by the manipulation, and in these cases the reflexes should be abolished by local cocainization of the mucosa. We firmly believe that narcotic anesthesia by reducing the tendency to aspiration pneumonia offers a means of reducing the high mortality-rate of such operations as laryngectomy. For the removal of malignant tumors of the face, mouth, jaws, neck, thorax, and brain, and for the radical mastoid operation, especially in middle-aged or elderly people, narcotic anesthesia is usually to be preferred to ether or chloroform. In persons debilitated or suffering from pulmonary disease or having other contraindications to ether the method may also be used with advantage for operations upon the intestinal, biliary, or renal tract, or upon the pelvic organs. For abdominal operations, in this class it becomes especially satisfactory if the abdominal walls are relaxed or greatly distended, as by a large tumor. During acute alcoholic mania patients often receive injuries requiring surgical treatment. Over ten years ago we observed that these patients became quieted and nearly insensitive to pain after a single

full dose of apomorphine. *This method must not be used in asthenic alcoholic mania.*

In a number of particulars the method of administration differs from that usually advised.

Technique.—The patient is prepared as for an ordinary anesthetization by means of baths, laxatives, and enemas. Seventy-five minutes before the time of operation the patient receives, by hypodermic injection, scopolamine hydrobromide 1/100 grain and morphine sulphate 1/6 grain. From this the patient usually becomes somewhat sleepy, but remains conscious. An enema is now slowly run into the bowel by gravity, consisting of compound spirits of ether ½ ounce, whisky ½ ounce, and warm water to make 4 ounces. Fifteen minutes later the hypodermic is repeated. Following this the patient's drowsiness increases and some reduction in sensibility may be noticed, but the patient often remains conscious. Twenty minutes after the second, guided by the pulse, pupils, respiration, and cutaneous sensibility, a third hypodermic containing apomorphine hydrochlorate 1/30 to 1/10 grain, and scopolamine hydrobromide 1/100 grain, and, at times, morphine sulphate 1/6 grain, is given. This is not, as a rule, followed by vomiting. Should the patient prove refractory to hypodermic number three and anesthesia not be produced, hypodermic number four may be given after an interval of at least fifteen minutes. This consists of morphine hydrochlorate 1/6 grain, apomorphine hydrochlorate 1/20 grain, scopolamine hydrobromide 1/100 grain. The dose of apomorphine is to be regulated by the condition of the patient, and is to be used sparingly or avoided in the asthenic.

Modifications.—In persons habituated to narcotics, the dose of morphine and apomorphine may have to be cautiously increased or repeated. Not more than 1/10 grain apomorphine should be administered at a dose, nor more than 1/15 grain in the weak or debilitated. In operations about the bowel, in lieu of the enema the following draught is given: spiritus ætheris compositus 3 drachms, spiritus frumenti 3 drachms, and water 2 ounces. Scopolamine-morphine anesthesia should be given with a supervision, intelligence, and care equal to that demanded in ether anesthesia. For excessive narcotism, which should be rare, the patient is catheterized and given an enema of black coffee 1 pint, aromatic spirits of ammonia 2 drachms, tincture of capsicum ½ drachm, and hypodermics of caffeine and strychnine are administered.

It is interesting that while our resident physicians view with equanimity the profound drug narcoses of the surgical wards, they spend hours industriously walking, flagellating, and stimulating the much milder cases of opiate poisoning admitted to the receiving ward.

Spinal Anesthesia.—For the past eighteen months we have employed spinal anesthesia in most of the cases of operation upon parts of the body below the level of the anterior superior spines of the ilium, and our experience embraces between 150 and 200 cases in which stovaine, alypin, eucaine-lactate, or tropacocaine alone or in combination with some adrenal product has been employed. From this experience we believe that spinal anesthesia enables the operator, in selected cases, to reduce the morbidity or mortality of operations. Clinically there seems to be no great difference in the relative toxicity of stovaine, alypin, eucaine-lactate, or tropacocaine. When a dosage exceeding 6 centigrammes of any of these drugs is used for rachi-analgesia, vomiting, circulatory depression, and transient syncope are frequently observed. Tropacocaine produces an analgesia that often involves the lower thorax, while that produced by stovaine or alypin rarely extends above the anterior superior spine of the ilium. There is an apparent wide variability in various samples of stovaine that we have employed. Some are followed almost invariably by

severe and protracted headache, while from other preparations the secondary headache is milder and often absent. We finally abandoned all solutions of stovaine except that prepared by Billon. Cocaine should never be used as a spinal analgesic. Eucaine-lactate, while preferable to cocaine, is decidedly inferior to other spinal anesthetics. Of the synthetic alkaloids, alypin is evidently preferable to the weaker novocaine and closely resembles stovaine in action. It has given better results than the worst solutions of stovaine, but more untoward effects than the best solutions of stovaine we have employed. Tropacocaine is the chief one of these drugs that can be advised for abdominal operations, and in general is the most useful spinal anesthetic that we have tried. Yet for operations upon the legs, perineum, and rectum we have used certain preparations of stovaine with excellent results. We have had no cases of infection of the meninges following spinal anesthesia, although we have repeatedly made the injection in the presence of severe forms of sepsis. One of our patients died shortly after the injection of alypin, but this man was nearly moribund and was doomed irrespective of the anesthesia. The method has been successfully used in patients from three to seventy years of age. In four or five per cent of the cases there is failure to produce sufficient anesthesia from error in technique or other cause.

Appendicitis.—Despite the voluminous writings and lectures upon the subject, there are certain important points that apparently have not received the attention they deserve. One of these has been emphasized by Murphy, and is the importance of the chronology of symptoms in the disease. Our experience has corroborated the great usefulness of this factor in the differential diagnosis. An attack of appendicitis begins with (1) diffuse abdominal cramp or colic, which is followed by (2) nausea and frequently vomiting, and this in turn is succeeded by (3) localization of the pain with tenderness, and if there be peritoneal involvement, by rigidity over the right iliac fossa; and (4) by temperature elevation, which, however, may not be marked. If the history shows that the symptoms have unfolded in this order, one may unhesitatingly make a diagnosis of appendicitis, and usually will be justified in advocating immediate operative intervention. If, however, the tenderness has preceded the general abdominal colic, pelvic disease, especially tubal or ovarian, is to be considered, and here the suggestion of Morris seems at times of value, that a single distinctly localized point of tenderness to the right of the umbilicus suggests appendicitis, while if two tender points be present, one an inch to the right, the other an inch to the left of the umbilicus, then the symptoms are probably due to disease of the uterine appendages. If the history indicates that fever, even though mild, has preceded the other symptoms, no matter how characteristic these may be, typhoid is to be considered; or pneumonia with peritoneal symptoms. In renal colic the initial diffuse abdominal colic is absent.

We consider, therefore, the chronology of symptoms to be frequently of the utmost value in the avoidance of error in diagnosing appendicitis and in determining the necessity of surgical intervention. A second point concerns the treatment of appendicitis, and is to emphasize the importance of avoiding intestinal traumatism or exposure in the more desperate cases in which there is marked peritoneal infection. The abdominal incision we have employed for four years is rarely longer in the complicated than in the uncomplicated cases. Except in the very obese, a transverse incision about one and one-half or two inches in length with a splitting of the aponeurosis and muscle entirely suffices for all operative work. If the appendix be behind the cecum, between the folds of the mesoappendix or mesocolon, the head of the colon is merely exposed, the base of the appendix doubly clamped, divided, cauterized, and then the appendix

bluntly stripped out from under its peritoneal investment by dry dissection carried close to the muscular coat of the organ. If there be much inflammation, the vessels close to the appendix are usually thrombosed, there is little or no hemorrhage from such subperitoneal enucleation, and ligatures may often be omitted. If there be a wide-spread peritonitis, then the greater reason that the vitality of this damaged serosa be not further reduced by exposure or by handling. The excess of fluid is removed through the small incision by gently sponging with dry gauze, a drain introduced down to but not between the intestines, and the patient quickly returned to bed, placed in Fowler's position, given frequent enemas, but no liquids by mouth, until the escape of flatus shows the subsidence of inflammatory ileus.

In the desperate cases with purulent peritonitis, in which the bowel is partially gangrenous, and ruptures during the manipulation, no attempt is made to suture the partially necrotic tissues, but gauze packing is rapidly introduced against the damaged bowel, and the patient, constantly maintained in the semiupright position, is hurried to bed as rapidly as possible. In these very serious cases the operation should not consume over ten or fifteen minutes. Disinfection, inversion, or elaborate suture of the stump are useless and even dangerous, because they consume time and involve unnecessary manipulation. The base of the appendix is merely tied and cut off and left close to the wound against the gauze drainage. We repeatedly have seen small fecal fistulas follow such operations, but they have invariably closed spontaneously within a few weeks. We have never seen hernia follow a drainage operation for appendicitis in which the incision was small, and the fibers of the external oblique split and not divided. In this type of operation spinal anesthesia is preferred, and the patient is kept quiet during the first twenty-four hours after the operation by means of opiates.

Surgery of Nerves.—Bearing upon the moot point in nerve surgery as to whether nerves ever primarily regenerate or not is the case of a young man for whom we resected one-half inch of the ulnar nerve after it had, in part, been paralyzed by a stab wound, and observed well-marked restoration of power and sensation in the nerve distribution within three days after the operation.

An early partial restoration of function in cases of neuritis has also been observed after splitting the sheath of the affected nerve and carefully disassociating the nerve fibers. We have now operated in three cases in which marked and almost immediate improvement followed such an operation. Several years ago we found that the sciatic nerve could be so split as to practically separate it into the bundles supplying the anterior and the posterior part of the leg. In a case of old sciatic palsy following dislocation, after splitting off the bundles supplying the anterior and more paralyzed portion of the leg, the nerve segment was carried through the thigh between the bone and adductor muscles, and anastomosed with branches of the anterior crural nerve. In this case, although the restoration of function was limited, the accuracy of the nerve separation was indicated by the fact that there was practically no increase in the paralysis of the posterior leg muscles as a result of the operation. More interesting was the recent attempt that has been made at the hospital to carry split-off segments of healthy nerve fibers across the body to supply paralyzed corresponding nerves. In a case recently reported of nearly complete brachial palsy from anterior poliomyelitis, segments of the healthy left brachial plexus were carried across the neck under the anterior muscles and anastomosed to split-off segments of the paralyzed right brachial plexus. Three months later the shoulder drop had disappeared, the child could move the shoulder and rotate the arm at will, and had gained power of flexing the fingers and of grasping objects

In the treatment of tic-douloureux a fuller experience has in no way lessened our confidence in the injection of a two-per-cent solution of osmic acid directly into the exposed nerve trunk. In no case have we failed to obtain some relief, although in a proportion of the cases it has been necessary to repeat the injection in other affected branches of the trigeminus, or occasionally in the same branch, apparently because all of the involved fibers were not destroyed by the acid.

Varicose Veins and Varicose Ulcers of the Leg.—These very prevalent and distressing conditions have been carefully studied from the view-point of their operative treatment with the assistance of Dr. W. A. Steel, and an operation which we have perfected for extirpating veins has been given considerable clinical trial. The operation consists in exposing the vein a short distance below the saphenous opening through a one-inch incision, and then introducing into the vein from above downward a long, bulbous, double-ended probe, to the shaft of which the distal end of the divided vein is firmly tied. The lower bulbous end of the instrument is then exposed through a half-inch incision, grasped, and by traction pulled out, the upper bulbous end pushing ahead of it the trunk of the internal saphenous vein. We have been able in this way to remove from 22 to 24 inches of vein by a single maneuver. Occasionally brittleness of the vein or defects in the technique render a larger number of incisions needful. Taken altogether, the method seems superior to the operation of Trendelenburg, of Mayo, or the many other methods of extirpating this great venous trunk. Dr. Steel, who has carefully studied the after-course of these patients, finds that if there is not a widespread, fine dilatation of the capillaries, or edema, and if the internal saphenous is the chief trunk involved, this operation is followed by prompt healing of the ulcer and a satisfactory cure. If, however, the skin of the leg shows a network of capillaries and dilated veins, then while the operation gives benefit there is often a tendency for the ulcer to heal only partially, or if healed, to break down again. In such cases, therefore, the interrupted Schede incision, as suggested by Powell, is added to the operation of extirpating the chief vein trunks. The combination of these two operations has proved almost uniformly curative, while the Schede or the Powell operation alone is at times followed by relapse.

Bone and Periosteal Transplantation.—Regeneration of bone occurs chiefly from the periosteum. In the healing of fractures the amount of bone formed by the endosteum or from the osseous tissue itself is inconspicuous as compared with that formed by the outer covering of the bone. This well-known physiological fact has suggested the use of periosteal flaps or of transplantation of portions of periosteum to bridge defects in the shafts of long bones. We have employed for this purpose ivory pegs inserted into the ends of the fragments to immobilize the bone, and have bridged the gap by turning down flaps of periosteum and also by using grafts of periosteum transplanted from one of the ribs. In one case after a crushing injury of the hand, with a total loss of the second and third metacarpal bones, the soft parts were replaced by pedicled flaps from the abdominal wall and the bones by sections of rib with attached periosteum, that previously had been carefully excised by means of circular power saw. In this case the skiagraph shows the retention of the transplanted bone.

Conservative Treatment of Advanced and Recurrent Cases of Sarcoma.—Differing from other malignant tumors, sarcomas are usually fairly well encapsulated. This encapsulation becomes more marked after *x*-ray treatment. The Roentgen rays have a marked destructive action upon the sarcoma cells, yet if the tumor be very large this action is often not sufficient to arrest the disease. Moreover, the degenerative tendency present in all massive malignant neoplasms is enhanced by the rays and

the patient's life falls in jeopardy, it may be, not from the growth of the sarcoma cells, but from their death and the absorption of toxic products from the sloughing mass. These patients neither bear severe mutilating operations well nor are they assured against recurrence by even the most extensive operation that has yet been hazarded by the surgeon. The *x*-ray treatment alone is insufficient, and surgical intervention alone is likewise insufficient, yet we are impressed by the thought that the combination of the two methods offers the best chance to the patient. Certain conditions are absolutely required, however, in order to obtain the best results. First, the *x*-ray treatment must be given by an expert over a very prolonged period of time. It may be that daily treatments with a carefully regulated dosage will be necessary for three or four months before any results are perceptible. Thus there is required first of all not a little faith and persistence on the part of the patient. The second point is the necessity for surgical *enucleation* of all masses as soon as they become a peril to the patient from necrosis or from mechanical pressure. The operation should be of the simplest character, local anesthesia being often all that is required. The overlying tissue and capsule of the tumor are incised, and with the finger or blunt separator the contents of the sac are rapidly enucleated, the sac wiped clean and dry and painted with a strong alcoholic solution of methylene blue. After the operation the *x*-ray treatment is at once resumed. If other tumor masses develop under the treatment these are likewise subjected to subcapsular enucleation. In three patients with recurrent sarcomas in whom treatment along these lines has been carried out for a period of from six months to a year and a half, the cachexia has disappeared, the patients have gained in weight, and, undoubtedly, at least a prolongation of life and a great increase in physical comfort have been obtained. In one of the cases there was a large sarcoma of the testicle, with later involvement of the deep pelvic glands; in a second, an enormous sarcoma of the shoulder and chest wall; the third, a recurrent sarcoma of the forearm. Cases that were nearly contemporary as to time, and that have had amputation or other mutilating operation, or other forms of treatment, have all died. It is believed, therefore, that the conservative treatment here outlined deserves a wider trial.

The Non-operative Treatment of Serious Injuries of the Forearm and Hand.—A few years since there was an understanding in the service of the Samaritan Hospital that all amputations below the wrist were to be placed in charge of the resident physician, and as a result there soon arose quite a competition between members of the resident staff as to who should have, during the service, the largest number of such amputations. We were amazed to find that amputations of the fingers constituted one of the most common of operations in the dispensary service, and at times several fingers were amputated in a single week. A rule was therefore enforced that no general anesthetic should be given, and that no amputation be done except under the direction of the attending surgeon or his qualified assistant. Although the dispensary service was progressively increased as to the number of cases attended, amputation of the fingers or hand has become very infrequent. After any severe accident to the hand an effort is made to retain all of the attached tissue that the patient brings to the hospital. After severe *crushing* injuries not only are sutures interdicted, but if the skin be not already freely opened as a result of the injury free incisions may be made to prevent compression of the vascular channels by the secondary swelling. The parts are then carefully arranged in position upon a splint in a loose gauze dressing, and if severe secondary inflammation is feared, continuous irrigation is used until the acute inflammatory reaction has subsided. As soon as healthy granulations are well started,

large denuded areas are covered by Thiersch grafts, or, especially if there be denuded living bones, by large pedicled flaps taken from the abdomen. After nine days the patient is again anesthetized and the flap cut free from the abdomen and arranged in position. In this way hands that have been ground between cog-wheels, crushed between bumpers or under car wheels, that ordinarily would have been amputated, have been partially or completely preserved. Even portions of phalanges found to be living within a gangrenous finger have been preserved with good functional and cosmetic result. This method is much more troublesome to the patient and the surgeon than simple amputation, yet so much is gained as to later usefulness that no patient has regretted the increased suffering, or requested that the tissue saved be later removed. There has been no mortality from this conservative treatment as applied to the hand and arm; although for the leg and foot it is admitted that such conservative treatment has less to commend it, and at times is fraught with increased danger to life.

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THE PRINCIPLES UNDERLYING THE TREATMENT OF TUBERCULOSIS.[1]

BY F. M. POTTENGER, A.M., M.D., MONROVIA, CALIFORNIA.

Since the time when the scientific world began to recognize tuberculosis as being a curable disease, the treatment of it has undergone many changes. The tendency of these changes has been to make the methods of treatment more rational and the measures more scientific.

The medical profession but imperfectly appreciates the degree to which tuberculosis is curable. Perhaps the majority of physicians still hold to the opinion that it is an incurable disease, and while hearing of results that have been obtained, they either look askance upon the diagnosis or question the reliability of the reports. The hope of the world seems to be still centered on the future, when it is expected that some magic remedy will be discovered which will be a sure cure for this disease. Men with this attitude cannot appreciate the measures which we now have at hand. If they would but grasp the nature of tuberculosis, and then study the measures which we have to-day to combat it, they would see by a careful study of the principles which underly the cure of this disease that by waiting and looking to the future we are losing valuable time, and uselessly sacrificing lives. If laymen were taught to recognize the early signs which carry suspicion of tuberculosis, and members of the medical profession were capable of examining chests with sufficient intelligence and thoroughness to recognize the early changes in physical signs which are due to tuberculous infiltrations, and both were sufficiently imbued with the curability of the disease and the necessity of prompt, energetic treatment, we could say the cure of tuberculosis is now at hand.

The most detrimental factor against the curability of tuberculosis is delay. It is not tuberculosis but neglected tuberculosis that kills. Statistics show early tuberculosis to yield readily to rational treatment, but neglected tuberculosis to be almost invariably fatal. The first principle then in the treatment of tuberculosis is early diagnosis. Without this our efforts at treatment must be greatly increased and our favorable results must be largely diminished. It is not sufficient to make a diagnosis of tuberculosis. Something must be done. The patient must have sufficient change brought about in his resisting force to successfully combat the infection, or he will succumb. When an early diagnosis has been made, the next step is to institute treatment without delay.

The necessity for this can hardly be ap-

[1]Read before the American Therapeutic Society, Washington, D. C., May 4 to 7, 1907.

preciated by the patient, for as a rule the victim of early tuberculosis does not feel ill; but it must be appreciated by the physician, and he must use his persuasive powers in impressing the patient with the necessity of immediate treatment. Delay is always dangerous.

Tuberculosis is a progressive disease. It seems to me that we have sufficient evidence at hand now to conclude that tuberculosis is primarily a disease of the lymphatic system. The germs gain entrance into the system through the mucous membranes, are carried to the lymph nodes and strained out by them. This being the place *par excellence* where the blood serum comes in most constant play upon whatever intruders find their way into the system of the host, most of the bacilli are destroyed and cause no further trouble. At times, however, the bacilli, in spite of the conditions unfavorable to their growth, succeed in establishing themselves in these glands; they multiply and cause a focus of infection. While we are not yet prepared to say that tuberculosis of other organs, such as the lungs, intestines, bones, joints, meninges, and larynx, is always an infection carried directly from the lymphatic glands, for we must recognize the possibility of the disease extending from one organ to another, yet scientific observations point to the glandular involvement as being the primary focus in the body.

We have not yet become bold enough to advocate the treatment of tuberculosis of the lymphatic system unless the glands show signs of suppuration, but the time will doubtless soon come when we will treat early infections of the glandular system with as much justification as we are now treating early extensions to other organs. When other organs become involved immediate treatment must be instituted in order to prevent the disease from spreading and to sufficiently reënforce the resisting power of the patient to aid him in overcoming the infection.

Not only should treatment be instituted at once, but this treatment should be a rational one. The adoption of the wrong treatment at this favorable time may be the cause of the death of the patient. It seems to me that we can spend a few moments very profitably in discussing the principles which underlie the treatment of tuberculosis. We shall endeavor to indicate the results which are to be aimed at in treatment, and then to show in what manner the various measures which are recognized as of value meet these indications.

Tuberculosis is a disease which is caused by a specific microörganism, and like all similar diseases its cure consists in establishing on the part of the host an immunity to the specific microörganism and its toxins. No matter what form of treatment is instituted it must work either directly or indirectly toward that end if it is to be of any value. If a cure results, immunity has been established.

The term immunity as here employed is not immunity in that narrow sense in which it is so generally used, designating a condition in which an individual sometimes exists wherein it is impossible for him to become infected with a certain specific microörganism, but in that broader sense in which it is used in modern medicine to designate a certain resisting power which is developed in an infected organism against the specific microbe or the toxins of this microbe which produces disease. Immunity in this sense is of all degrees: it may be partial, it may be complete, it may be transitory, or it may be permanent.

Many times we see a partial immunity develop. The patient improves for a time and it seems that he will recover, but for some reason the disease assumes an increased virulence and the host is overcome. In most bacterial diseases we note these periods of improvement and exacerbation. In tuberculosis this is especially noticeable. Sometimes immunity is established, resulting in a cure; but the immunity is only transitory, and in a short time the patient may become infected again. Pneumonia is a good example of

this. On the other hand, a cure from certain other diseases, such as smallpox, usually results in an immunity which lasts a lifetime.

In the treatment of tuberculosis, then, we are not attempting, much as it is desired, to bring about a state whereby an individual who is suffering from the disease will be incapable of ever becoming infected again, but we are endeavoring to so strengthen his resisting forces that he will be able to overcome the tubercle bacilli and their toxins, and become cured of his disease. We are endeavoring to establish, as far as he is concerned, an immunity to the infecting bacilli and their toxins.

While there are many elements which enter into the production of immunity which we cannot discuss at this time, yet there are certain broad underlying principles which we can discuss to advantage.

By studying the phenomena which occur when an infection is taking place, we may learn nature's method of curing infectious diseases. The production of immunity is a chemical process and is due to a reaction upon the part of the cells of the invaded organism in response to stimulation caused by some foreign element. In tuberculosis this necessary stimulation is caused by tubercle bacilli and their toxins.

When specific microörganisms gain entrance to the body tissues a struggle for mastery at once ensues. The blood is naturally endowed with defensive bodies, and when an inoculation occurs these at once attack the invaders, some of which are destroyed. This destruction of bacteria sets free toxins which further stimulate the body cells to the production of more antibodies which at once are applied to the destruction of the bacteria. In many instances this stimulation sets the machinery of immunization into action, so that the blood is flooded with more antibodies than are found in it under normal conditions. The bacteria, on the other hand, are not idle; they are multiplying, and at the same time suiting their environment to their own defense. Their presence causes an irritation with stagnation of the lymph and blood current, and thus the antibodies are not applied directly to the microörganisms. In the case of some of the bacteria, such as the tubercle bacillus, there is a further defense thrown about the microörganisms in the form of the wall of the tubercle. While the tubercle may be primarily a means of defense for the invaded organism against further inroads of the bacilli, in the end it works against the host because the bacteria shut up in the tubercles are shielded from the free access of the body fluids with their protective bodies.

Whether the bacteria or the invaded organism shall conquer in this struggle depends, first, upon the number and virulence of the bacilli, and secondly, upon the manner in which the body cells respond to the formation of antibodies. The antibodies which are produced at such a time are of several different kinds. Antitoxins, lysins, agglutinins, coagulins, precipitins, and opsonins have been studied so far, and it is probable that there are still others which are as yet undiscovered.

It is very important to know that these specific antibodies can be produced not only by the inoculation of living virulent bacteria, but by bacteria which have been killed. The only essential is that the chemical element in the bacteria which calls forth the elaboration of the antibodies remains intact. Experiments carried out with dead staphylococci, typhoid bacilli, vibrio of cholera, and products made from tubercle bacilli show that they stimulate the organism to the formation of the very same immunizing elements as are produced by the living microörganisms. Thus we may by vaccination with dead bacteria or bacterial products set the physiological machinery of immunization into activity and immunize our patient.

Another fundamental principle in immunity is that the antibodies resulting from an infection or from a vaccination are specific for the microörganism which sets the machinery of immunization in motion

and causes their elaboration. Thus typhoid bacilli cause typhoid antibodies; staphylococci, staphylococcus antibodies; and tubercle bacilli or tubercle vaccine cause antibodies for the tubercle bacillus.

While I do not know whether any experiments have yet been made to determine by actual measurement the relative resisting power of individuals in normal health and those with lowered vitality, yet it stands to reason that a man in normal health should be less prone to infection than when in ill health. It also seems but common sense that a man whose nutrition is good should offer more resistance to a disease than one whose nutrition is poor.

With this brief discussion of nature's method of curing infectious diseases, we can now intelligently approach the subject of the treatment of tuberculosis. We can understand nature's method and we can estimate the part played by each of the various measures which we employ.

We can see that the ultimate aim of scientific therapy in tuberculosis is the establishment of immunity, whether it be indirectly, by improving the general condition of the patient and making him more resistant, as is done by placing him in the open air, furnishing him with nutritious food, and training him in the proper way of living, or directly, by artificially increasing the antibodies of the blood by the inoculation of tubercle vaccines. We cannot understand the cure of tuberculosis in any other light than this. If a cure results, it is because the organism is either naturally supplied with sufficient antibodies, or, stimulated by the toxin of the tubercle bacillus, has arisen in its own defense and produced sufficient antibodies to overcome the infection.

We would classify the various measures employed in combating tuberculosis under six heads:

1. Those which aid in bringing about immunity by endeavoring to restore the natural resisting power of the patient to a point as nearly normal as is consistent with the condition present. Among such measures we must class fresh air, hygienic measures, proper diet, hydrotherapy, favorable climate, and suitable tonics.

2. Those which aid in bringing about immunity by artificially stimulating the body cells to the production of more specific protective substances. In this class falls vaccination, or treatment by the injection of the specific products of the bacillus, such as tuberculin, extracts of the tubercle bacillus, and bacillus emulsion.

3. Those which aid in establishing immunity by supplying to the organism specific protective substances which were produced by vaccinating some animal, such as the horse or cow. Under this head come the various antitoxic sera.

4. Those measures which cause an increased flow of blood or lymph to the seat of the infection, thus bringing a greater amount of the specific antibodies into contact with the bacilli and causing their destruction. Bier's hyperemia, Finsen light, poulticing, and the local congestive action of tuberculin are measures whose action is explained in this manner.

5. Remedies and measures which relieve symptoms.

6. Measures which relieve any secondary infection that may be present.

Thus it can be seen that there is nothing specific in such measures as fresh air, good food, the regulation of rest and exercise, hygiene, hydrotherapy, and tonics, yet they have their purpose in the treatment of tuberculosis. By these measures we sharpen the appetite, improve digestion and assimilation, strengthen the heart, improve the quality of the blood, tone up the nervous system—in a word, we bring the patient to a point where he is as nearly a normal man as is possible considering the pathological condition from which he is suffering.

How much this falls short as measured by the opsonic power of the blood has been determined by Lawson and Stewart (*Lancet,* Dec. 9, 1905) in twenty-four patients who were treated by ordinary open-air

methods in a sanatorium in Scotland. These patients had been treated for a period varying from one month to two years at the time of this investigation. If we take the normal healthy individual's opsonic index as 1, and compare the indices of these patients with it, we find that after this period of open-air sanatorium treatment the indices of twenty out of the twenty-four patients was below .8, the average being .75. This means that ordinary hygienic, dietetic, open-air treatment as carried out under the most favorable circumstances was able to bring the body fluids of these patients to a condition where they were able to prepare only three-fourths as many tubercle bacilli for destruction as the body fluids of a normal individual.

We can also see from the discussion which has preceded that the products made from the tubercle bacillus do have a specific action, and when injected artificially raise the content of protective bodies in the blood. This being true, we might hope by proper dosage of these products to greatly aid the organism in its attempt to overcome the infection.

That this is not theory only, but that it works out in practice, is proven by these same cases mentioned above. After six weeks' treatment by the inoculation of tuberculin the power of the body fluids of these patients to prepare tubercle bacilli for destruction by the phagocytes was raised from three-fourths of that of a normal individual to 1.19, or 19 per cent more than a normal individual. Thus by the injections of tuberculin the body fluids of these patients were able to prepare 58.6 per cent more bacilli for destruction than they were under open-air methods alone.

It is probable that an invaded organism in good nutrition is able to respond by the production of more specific antibodies than one which is debilitated. It can also be definitely shown that by the inoculation of specific vaccines the physiological machinery of immunization may be set in motion so that the body cells produce more defensive bodies than they will without such stimulation. But the treatment of tuberculosis is not so simple as this. We have more to do than to keep the nutrition high and raise the content of the antibodies in the blood. We must also bring the antibodies to bear on the bacilli, and when we recall the nature of the tubercle, its lack of vascularity, and the condition of stagnation of lymph and blood which ensues in and about a mass of tubercles, we can see that a very important part of treatment is to use some method by which an increased flow of blood may be directed to the part. The importance of this in joint tuberculosis has been established by Bier and his followers, and it now remains for the method to be applied to tuberculosis of the lungs.

In tuberculin we have an agent which causes a hyperemia and thus fulfils the double function of stimulating the cells to the formation of more antibodies and of bringing them to bear upon the bacilli in such a manner that they can be of greatest protective value.

Finsen's light, perhaps, owes much of its efficacy to the hyperemia that it produces, and in those cases in which it is of little avail in treatment Bulloch has shown that the content of the blood in specific antibodies is low.

It is probable that through the employment of light rays or some form of electricity we may some day arrive at a means of satisfactorily causing a hyperemia in the tuberculous areas in the lung, thus greatly assisting nature in her cure of the disease.

Another factor of great importance in the treatment of all cases of tuberculosis which are advanced beyond the incipient stage is mixed infection. There are present other complicating microörganisms which interfere with healing. It is probable that through further research by methods which have been given us by Wright we will be enabled to determine definitely the character of mixed infection and to apply the proper vaccine for its cure.

Thus we conclude that the first principle

of treatment in tuberculosis is early diagnosis. This should be followed promptly by energetic, rational treatment. The rational treatment consists, first, in making the patient as nearly a normal individual as is consistent with the condition present; secondly, in artificially stimulating the defensive powers; thirdly, in bringing these antibodies to play on the bacilli as directly as is possible; and fourthly, in relieving any associated mixed infection that may be present.

REMARKS UPON THE THERAPEUTIC ACTION OF CONVALLARIA.

BY WILLIAM LENNEKER, M.D., CHICAGO, ILL.

My experience with the fluid extract convallaria (lily-of-the-valley) has been very extensive and very successful. For the last five years I have been giving it to my patients in all kinds of heart affections, with the exception of fatty degeneration of the heart. In that pathologic condition convallaria cannot be used and becomes detrimental. Digitalis is perhaps the best known, and is a fairly reliable heart tonic, but it has some disagreeable by-effects and after-effects, which become sometimes very troublesome to the practitioner. First of all, digitalis will, after a person has taken several large doses, suddenly exert its action, and then instead of helping the patient, make him ill. Again, it will when given in large doses upset the stomach, take away the appetite, and cause vomiting. In cases of heart failure caused by injuries, where the patient is also vomiting, digitalis cannot be used, or can only be used with very little effect.

But this is not the case with convallaria, which in itself is one of the best tonics for the stomach we have. It gives tone to the stomach, increases the appetite, and what is more, it exerts a tonic effect upon the intestinal mucosa, increasing the action of the bowels in a great many people.

Shoemaker (Materia Medica and Therapeutics) says: "In small doses this drug (convallaria) strengthens the heart's action. In larger quantities it restrains excessive cardiac activity. It has been found of service in mitral insufficiency. It quickly relieves the dyspnea and palpitation, and after having been given for two or three days may be discontinued for a week or more without recurrence of symptoms. Convallaria seldom disagrees with the stomach, and no cumulative action has been observed. As a rule, the appetite and digestion seem to improve under its use, and regular action of the bowels is promoted."

Ellingwood, in his Materia Medica, speaks very highly of it, and says: "It strengthens the heart's action, slows the rapid and feeble pulse, corrects the rhythm, improves the tone and increases the power of the heart, as evidenced by the increased tonicity throughout the entire capillary circulation. Its influence is exerted in a regular, steady, and permanent manner. It is also efficient in the dropsy of Bright's disease. It is useful in the enfeebled heart of phthisis pulmonalis. In rheumatic endocarditis and pericarditis it serves a double purpose: it strengthens and improves the tone of the heart, and favors the elimination of morbid products which cause inflammation. But few remedies will act more efficiently. To sum up the influence of convallaria, it is used to excellent advantage in the tobacco heart, in the asthmatic breathing from enfeebled heart, and especially in chronic asthma.

"Germain-Sée mentioned its use in the following pathological conditions: He highly recommends it in simple cardiac arrhythmia; in palpitation resulting from a state of exhaustion of the pneumogastric

nerve, the most frequent source of palpitation. In mitral constriction, especially when it is accompanied by failure of compensation on the part of the left auricle and the right ventricle, the cardiac force augments visibly under convallaria, as the sphygmograph testifies. In mitral insufficiency where there are pulmonary congestions, in dilatation of the heart, without fatty degeneration, convallaria is indicated. In all cardiac affections, indifferently, from the moment that cardiac inflammations appear, convallaria has an action, efficient, prompt, and certain."

My own cases have been of the following type:

CASE I.—I was called to see a young woman who had been operated on for appendicitis. The woman had recovered from the operation, but being pregnant before the operation she was now, two weeks later, threatened with miscarriage. She was in a highly nervous state, and had severe headache, excessive vomiting, and acute pains in the abdomen. She had been given before I came several doses of morphine by mouth and rectum, without any effect. I found the most dangerous feature to be her heart. The pulse was in such a condition that it could not be counted; it was at least 150 and irregular. She also complained of cardiac pain.

I took one-half ounce of fluid extract of convallaria and mixed it with three and one-half ounces of simple elixir. I instructed the nurse to give her this mixture in teaspoonful doses every half-hour, which would be eight drops of the convallaria. The woman retained the mixture, showing its sedative and tonic effect on the stomach, as it stopped the vomiting. When I returned two hours later she had taken thirty-two drops, and her pulse was already reduced so that I could count it. I now ordered the remedy to be given one teaspoonful every hour, and after six hours I had reduced her pulse to 120, full and soft. I now ordered the medicine to be given all night, two hours apart. When I returned the next morning the woman was much better and the pulse was 100, full and soft. From that time the patient made a good recovery.

CASE II.—The patient's heart was very irregular, with intermissions, becoming weak and getting stronger again. He said he could not sleep at night. Knowing the man to be in the tobacco business, I asked him how many cigars he smoked. He said that he did not smoke much, but that he tasted a great many tobacco leaves for rolling into cigars every day before purchasing the tobacco. I came to the conclusion that the man's trouble was due to excessive use of tobacco. He said, "If you want to give me digitalis, I have taken a bushel of it, and it does me not a bit of good." I told him I would not give him digitalis, but another medicine entirely different. I prescribed for him fluid extract convallaria 3 drachms, fluid extract nux vomica 1 drachm, and 3½ ounces of simple elixir. This was six drops of convallaria to a teaspoonful, and two drops of the nux vomica. I told him to take the medicine every two hours and report to me in two days. He came back after two days saying he felt considerably better, and that he had slept for the first time the night before. I felt his pulse, and although it was not altogether regular it was much improved. I directed him to take the medicine right along, every three hours, four doses a day. He took in all three bottles of this mixture of convallaria and nux vomica, and is a well man to-day.

Colbeck, in his work on Diseases of the Heart, says "the action of convallaria appears to be very uncertain, but the drug is sometimes of service, more especially when given in combination with strophanthus." Although I am not opposed to strophanthus, I have never seen strophanthus increase the good effects of convallaria. On the contrary, I have on several occasions tried to combine strophanthus with convallaria and found that the convallaria alone was better. I invariably use, and insist upon using, Parke, Davis & Company's tested fluid extract of convallaria.

162 ASHLAND BOULEVARD.

ONE YEAR'S EXPERIENCE IN THE HOME TREATMENT OF TUBERCULOSIS.[1]

BY WILLIAM M. DONALD, M.D.,
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A general objection which may be entered to this paper at the outset, and one which bears force in its trend, is that no one has any right to base any conclusions on one year's experience in a disease such as pulmonary tuberculosis, whose element of chronicity is greater than in almost any other disease with which we are acquainted. I beg to meet this objection at once by stating very frankly that I have no remarkable cures to announce in favor of such treatment, nor any disastrously fatal results, which might be used as an objection to such a line of treatment. What I desire to do is to give a frank statement of work done during the year; of success achieved, of failures resulting; to analyze as carefully as may be the cases as they are recorded, and to seek to draw lessons for all of us from failures as well as from successes.

It is hardly necessary to reiterate what has been said over and over again, that probably 98 per cent of our cases of tuberculosis, both of the lungs and of other tissues, must be treated at home and treated by the family physician. The very small minority of about 2 per cent may on account of their social and financial standing, or on account of a happy combination of circumstances, find themselves able to change their place of abode, and desist from all work while seeking a cure. Of the 2 per cent approximately who can do this I have nothing to say. Their numbers in the first place are too insignificant to consider, and their opportunities for feeding, for alternating their places of abode consistently with climatic changes, and for keeping themselves constantly stimulated by change of environment, all tend to make them comparatively easy patients to treat, and, if they are at all amenable to discipline, to cure.

The most of our cases of tuberculosis occur, as is well known, among the middle and poorer classes. Most patients must support themselves, and likewise frequently support several of their immediate family, while they are undergoing treatment.

Let us say then as preliminary that about 98 per cent of all cases of tuberculosis of the lungs must be treated at home, and that of the 98 per cent about 80 to 90 per cent must support themselves as well as aid in supporting others.

Fortunately for us as physicians, and fortunately for our patients as such, it has been discovered by incontrovertible experience that many cases do better at home under the care of their own family physician, with the judicious, loving attention of kindly relatives, than away from home, either in a sanitarium with strange surroundings, or in an ideal climatic environment where conditions for obtaining necessary food and for securing necessary funds are notoriously bad.

A change of heart in this regard has come with remarkable rapidity during the last ten years. Ten years ago it was thought extremely inadvisable for any tubercular patient to remain in his home climate; while now the trend of belief is that, generally speaking, the patient does better to remain in his home environment providing his case is taken in charge early enough. The general feeling is, moreover, that a person cured in a remote region and in a high altitude, and with dry air, must constantly remain in those surroundings and under those conditions to maintain the cure. Life in such environment might not be at all unpleasant, were it possible for an ordinary artisan or workman to secure the opportunities for obtaining a

[1]Read before the Michigan State Medical Society at Saginaw, Mich., May 16, 1907.

livelihood there, but as is well known the favored region for tubercular patients is the region of aridity, such as the mountains of Arizona and New Mexico, or the sands of California and Florida. There a man has difficulty in living sometimes with wealth at his command, while one with nothing but the labor of his hands to maintain life in his body is sure to starve.

Let us state here likewise, also as a reiteration, that the treatment of pulmonary tuberculosis resolves itself into the treatment of general malnutrition. A poor climate with excellent food and cheerful surroundings is inexpressibly more to be desired for a tubercular patient than an ideal climate with poor food and cheerless surroundings. Let it likewise be stated here that it is not so much a matter of climate, or particular kind of air, or particular altitude in which that air is inspired, as it is *air* itself. In other words, if we can get our patients to live outdoors in the climate of Detroit or elsewhere in Michigan, and at the altitude of those points in which they reside, they are to all intents as well off as if they were living outdoors in the altitude of Tucson or Santa Fe, and with the ideal sunshine of that location. Of course, it is very much more comfortable for a person to live outdoors twenty-four hours out of twenty-four with a climate such as those I have mentioned in the southwest than for one to do the same thing in the climate of Michigan, where one day may see the thermometer at 90°, and a week after may find it shivering around 30°. Moreover, the rainfall is much greater in our own neighborhood than it is in the points west, and that would naturally of course drive people indoors. However, with suitable shelter, and with a little insistence, proper clothing, and the proper direction from the physician, fresh air can be obtained in abundant volumes, and will do practically as much good here in Michigan as in the arid regions of the southwest. If, moreover, there can be found anything more pathetic than the picture of a sick tubercular man away from home, away from friends, unable to participate in the several activities of his surroundings, becoming morbid, losing heart, losing strength, losing shortly life, in these unwholesome environments, then I have not seen this more pathetic picture.

Like every other physician I have been enamored with this climatic cure of tuberculosis, and realize to its fullest extent the exhilaration which comes from an increase in altitude, and the blood changes which are so beneficial from such altitude. It is hardly necessary to remind you of the recent discoveries in regard to the increase in the hemoglobin and in the corpuscular elements of the blood which come from high altitudes. I have been, however, forced like other physicians to the conclusion that for all practical purposes, as I have suggested before, the great bulk of our patients must be treated at home, and must be put in shape so that they can continue their ordinary avocations at home. And since we know that fresh air, sunshine, abundance of food, and rest are essential in the cure of tuberculosis, and since these can be obtained at home as well as, or better than, in a remote region, I have adopted the home treatment of tuberculosis as the ideal one in handling this disease generally. For certain well-selected cases I should still recommend a climatic change with a high or low altitude to suit the individual case, or I might in certain cases even recommend an ocean voyage, or a residence in a lumber camp among the pines, but these cases would be by far in the minority.

Could these truths be forced home to every physician in the land, and could every physician be taught that it was necessary that he should give these cases special, continuous, and always encouraging care, stimulating by every means in his power the *hope* for a cure and *belief* in a cure, which are I believe among the chief essentials for a cure: could, moreover, every physician in this land be induced to watch for these cases of tuberculosis, to be on guard for them, to seize them at precisely the psychological mo-

ment, *i.e.* the period when the lung has not become seriously invaded, but when the pretubercular manifestations are well marked: and could he with urgency obtain from his patients acquiescence in his demands for a scientific antitubercular treatment—then I believe that in a few years this disease, this dreaded white plague, will have become changed, and we, who view so sadly the possibilities of cure in cases coming under our observation late in the disease, would have our sorrow changed to joy in the reception of cases always in the early stages and thus always presenting possibilities for a permanent and complete cure.

And in this connection I may be permitted here again to emphasize that which I think is too sadly and too generally overlooked, that if we desire to cure tuberculosis it is absolutely necessary that the cure should proceed from the earliest stage of the disease. Taken early there is no disease more curable; taken late there is no disease more hopeless.

Let me emphasize this fact still again, because I feel that it is one not recognized by the very men who should recognize it, if we wish ever to stamp out this plague, viz., the great body of general family practitioners, who see these tubercular cases always from the first, and usually in their pretubercular stage, the stage when the patient is ailing and sickening and preparing the soil for the reception of the pathogenic germs.

With then the disease properly diagnosed, and with the physician in charge possessing a full understanding of the principles of modern scientific treatment, it is incumbent upon him that he take into his fullest confidence the patient who is suffering from incipient tuberculosis; that he lay before the patient the true inwardness of the situation; that he insist upon him clearly understanding that he is a victim of tuberculosis; that according to modern scientific belief this is a curable disease; that the cure rests largely with the patient himself; that his cure must proceed at home and under the care of his family physician; and that the treatment will extend itself not over days or weeks, but over months and years. Let him understand fully, moreover, that it is the belief of the physician that with proper coöperation on the part of the patient the possibilities for cure are excellent.

With a proper understanding of the situation, such as I have enunciated, it becomes an easy matter to treat the patient.

There is no hiding from view the diagnosis, no surreptitious whispering to the friends, no ominous shaking of the head, no equivocation which may excite the suspicion of the afflicted one, but a frank, free, honest understanding between physician and patient. With such an understanding I think all of us will agree that the situation is greatly simplified and the cure wonderfully hastened.

Let me now recite some cases that have been under my care during the past year. I have had under observation in all eight cases during that time. One of them has passed from under my care into the hands of another physician and is about to die. I saw her first about November last. She was a young married woman, and had a large area of tubercular consolidation at the base of the right lung posteriorly. She had been for some time under the care of one or two other physicians, but, as I gathered from the patient, she had received practically no treatment beyond a little cough medicine. The case had been contracted from her brother, whom I attended for a few weeks last July, and who died in August, 1906. She was not a good patient to treat, being unruly and flighty, and seemed to be wholly unable to comprehend the true inwardness of the situation. I was very emphatic in regard to certain things being done if she wished at all to be improved, and there coming a sharp disagreement between the patient and myself I retired from the case after a week or two of treatment. My successor in the case I fancy found things equally bad, and was able to do but little for her.

The remaining seven cases I will discuss seriatim.

CASE I.—A young lady aged twenty-five, a stenographer and bookkeeper by occupation, came under my care a year ago last March. Her brother had died of tuberculosis a few years before, but with that exception there was no family history of the disease. This brother believed he had contracted the disease from a fellow workman. She had always enjoyed good health until a few weeks before her first visit to my office. A persistent cough for three or four weeks brought her to see me. I could find no well-marked lesion in the lung, but an examination of the sputum showed tubercle bacilli. The patient showed a constant slight rise of temperature of about a degree in the evening. She had good digestion, but an exceedingly poor appetite, an appetite which seemed hard to "whip into line." Although she had had a cough for only about three weeks, she had been tired and languid and weary for about two or three months, but thought nothing of it. She was ordered to discontinue her work entirely until the temperature became normal, which result was accomplished within about two weeks. Through the kindness of her employer at that time she was permitted to get away to some friends in the country for a prolonged stay. There the appetite improved rapidly, and the patient commenced to put on flesh quickly under forced feeding. The treatment consisted in rest in the open air for practically the twenty-four hours out of twenty-four, except when weary of resting she was permitted to take very moderate exercise. As soon as weariness supervened she was ordered to rest again, and to regulate her exercise entirely by her desires. At night she slept indoors, but had half the window removed, so that the air circulated freely and constantly over her bed. She was warned to fear foul air rather than drafts, and proved in this regard as well as in all others an admirable patient. The diet consisted of an ordinary nutritious mixed one, with the addition of raw eggs in the form of an egg oyster, to the extent of from two to six or eight a day (depending on her ability to digest them), and as much fresh milk as could be drunk, usually about a quart a day. After about two months in the country she returned to her work here in the city, and has pursued it for now almost a year with hardly a day's remission. She has gained twenty-four pounds in six months. Her cough has almost entirely disappeared, but the sputum still retains a moderate number of the tubercle bacilli. Her general health is good and she is able to handle her work perfectly well.

A peculiar complication occurred in this case which is worth considering for a moment. This patient, as I stated before, was an admirable one, and followed out the directions for forced feeding to the letter. Several times she forced her feeding beyond her limitations and developed acute gastritis, with inability to take any food for a week or two. I had warned her to be careful in this regard, but on account of her large gain in weight, and her general well-feeling and well-being from that treatment, she persisted in a forced dietary several times after this, even when her appetite was practically *nil*. The result has been that only a month ago she developed a horribly nasty case of gastritis, and has never been able to take food with relish since. This has taken off about five of the twenty-four pounds gain and has discouraged the patient somewhat. It will, I think, however, be a useful lesson to her to teach her to moderate at times her forced diet. Despite this the general condition of the patient may be considered excellent.

CASE II.—A young unmarried man aged twenty-seven, an expert accountant. He is a slight fellow, 5 feet 4½ inches high, and weighs 114 pounds, having lost 12 pounds in the last year. His family history is good, and his previous health has been likewise good, except that during the past year he has suffered with a cough, and with this loss of flesh as mentioned above. He has been under the care during the past few months of a physician who is likewise tuberculous, and who was so sick himself that he was wholly unfitted

to care for patients. The patient's temperature was almost constantly about 100°, pulse likewise 100, cough fairly constant, free mucopurulent expectoration, appetite poor, and coldness of all the extremities pronounced. Exploration of the chest disclosed a large area of infiltration over the supra- and infraclavicular regions of the left lung anteriorly. Tubercle bacilli were present in the sputum in large numbers. This patient was treated almost exactly as the first case recorded. He did badly, however, in the country, developed diarrhea, and felt that he was losing ground. He returned after a few weeks to the city, and has not left it since. Although he lived upon a noisy car line, with the dust of the street constantly disturbed and blowing in upon him, he nevertheless spent most of his time upon his veranda or taking short walks in the neighborhood until his temperature became normal, when he was permitted to take more exercise, and after the lapse of a couple of months to return to his work. He has worked steadily since last November, has maintained the weight which he gained during his months of rest, namely, 13 pounds, has a constantly normal temperature, and feels generally in fairly good health. I cannot see that the lesion in the lung is markedly changed, although I believe it has somewhat lessened in area. He developed February of this year a rectal fistula, which has added to his troubles, but it does not seem to have depleted his general vitality. The patient feels himself to be a fairly well man.

CASE III.—A young married woman aged twenty-two, 5 feet 8 inches high, and 113 pounds in weight. Her family history is good, and her own previous record is likewise good, except for an attack of neurasthenia four years ago, which was relieved within a few months. The patient came under my observation following an attack of typhoid fever in her husband. She was ill while she was nursing her husband, and her husband's case being a somewhat complicated one, little attention was paid to her until after his recovery. Careful examination then disclosed that the cough and difficulty from which she suffered was due to a tubercular infection, the chest exploration disclosing infiltration of the upper lobe of the left lung in front, and sputum examination showing tubercle bacilli. She was treated almost exactly the same as the other two cases, and has done fairly well. She has gained 9 pounds in the six months she has been under treatment, and has maintained this weight despite repeated attacks of indigestion and diarrhea. She is a somewhat hard patient to handle, inasmuch as she becomes morbid and melancholy upon the first appearance of any slight adverse symptoms, and has to be constantly stimulated by suggestion and buoyed up by hope. She, however, expresses herself as feeling much stronger and better than when coming under treatment six months ago, enjoys a fairly good appetite, takes from two to four raw eggs daily in addition to her mixed diet, but balks entirely upon milk, being unable to drink it at all.

CASE IV.—A young married woman of good family and excellent connections. She has one child aged eighteen months, who has been under my observation for the past year, being a case of difficult feeding and representing a lot of care on the part of the mother. The lady herself has been a patient of several other physicians, and came under my care only last December. She is tall and slender, 5 feet 7 inches in height, and weighing only 105 pounds. I found her suffering from a severe attack of neurasthenia, being morbid, melancholy, exhausted by the slightest effort, unable to eat, irritable, and generally sick. These symptoms she believed were due to the fact that she had "gone the pace" of society during the previous year, indulging in many of the foibles and a few of the extravagances of the social life of a large city. In this I was inclined to agree with her. She complained likewise of a slight cough, but attached little importance to it. I was suspicious of the cough, however, examined the sputum, and found tubercle bacilli to be present. I likewise examined

the chest carefully, but was unable to locate any point of infiltration in either lung. She was given the Weir-Mitchell rest cure for neurasthenia, a cure which by the way was likewise admirable for her tuberculosis, consisting of rest, massage, fresh air, and forced feeding. Under this treatment she improved rapidly, all her neurasthenic symptoms left her within a month, and within two months she was feeling very much herself again, being up and about the house, and participating occasionally in little social functions. A too great freedom in this regard, however, resulted in a nasty grippe attack which undid much of the good which we had accomplished, left her weak and debilitated, increased her irritability, and destroyed her appetite. It took me fully another month to get rid of these symptoms and put her back where she was before.

This I must confess is not an altogether encouraging case. The patient is high-strung, fond of gaiety, socially ambitious, and chafes under the necessary restraint of the cure. I have, however, discussed the whole situation frankly with her, and she has accepted it with a fair degree of equanimity, and has promised to aid us in the cure all she can. The combination, however, of severe neurasthenia with tubercular infiltration of the lung is not altogether a happy one for either physician or patient.

Case V.—A young physician who has suffered from several attacks of pleurisy with effusion. All of these have been relieved without aspiration, but about two years ago he commenced to lose flesh and to cough a good deal. Sputum showed tubercle bacilli, and exploration of the chest disclosed rough breathing over the upper borders of both lungs in front and thickening of the pleura of both lungs behind. About a year ago he consulted me with reference to his lungs, having in the interim been off for six months in the country in the fruit belt, living his entire time out in the fresh air and picking fruit, partly for pastime and partly as a means of livelihood. By this method of treatment he gained considerable flesh and strength, and decreased to a large extent his cough. I have seen and advised him at intervals during the past year. He has been able to resume his practice in a small country town, to which he removed partly on his own account, and partly on account of a tubercular sister whose case will be cited shortly. It is not necessary to go into the case in detail; suffice it to say he has done enough practice to support himself, his sister, and his sister's child, and has kept himself in fairly good condition. The lungs are still diseased of course, but he is generally in fair health. During the inclemency of the past winter he had several colds, which used him pretty roughly, but by discontinuing night work and country driving he has been able to keep himself in fairly good condition. The case is rather remarkable inasmuch as the man has been able to preserve his own independence and support two others besides himself while suffering as he is.

Case VI.—Is the sister of the previous patient. The probability is that she acquired the disease from her brother. She is a widow of about thirty-five years, with one child aged six. This patient found it necessary to work to support herself, but when she came under my observation was so weak that work was out of the question. Both lungs were invaded at their apices, temperature was about 100° constantly, and patient was coughing a sputum containing tubercle bacilli in goodly numbers. She had been employed in a close factory, and found it necessary to take street-cars early in the morning, when they were cold, insufficiently heated, and wretchedly ventilated. The hygiene of her house was likewise not any too good, and all in all the general conditions were what might be termed bad. I advised very strongly her removal to the country. Her brother rose to the emergency, opened an office in a country town adjoining Detroit, took his sister to keep house for him, supplementing my instructions for suitable hygiene by concrete example of right living, and has enabled her to so improve her

physical condition that she is now perfectly able to attend to the household duties for herself, her brother, and her daughter. She is not by any means cured, but is certainly vastly improved.

CASE VII.—The sister of Case II. She came to see me not about any cough, but about a condition consisting of malaise, anorexia, pain in the lumbar region, and general debility. I explored her lungs and examined her sputum and found nothing wrong, but with the brother's case before my eyes, with the possibilities of contagion so evident and with the general condition of debility so manifest, I concluded this to be a case falling into the pretubercular list. I could not, of course, diagnose anything tubercular in the case, but I was afraid of it, and felt that I owed it to her to put her in condition to fight off the germ before it obtained entrance to her system. I therefore proceeded by rest, by diet, by tonics, and by systematic education in breathing, etc., to build her up. She responded beautifully, and in a short time was in my estimation out of danger of any immediate infection. Possibly this patient would never have developed tuberculosis, but I was not going to take any chances, and by putting her where she is, in a condition of vigorous womanly health, I feel that I have done for her the best that any man could do under the conditions existing.

I have considered only those cases which have been continuously under my care for the past year, as they alone were susceptible of careful study and analysis. The floating cases which one sees twice or thrice, or only as a consultant, are not to be considered as possessing any value as cases for study, or as cases from which any conclusions whatsoever might be drawn. I have therefore not referred to this class at all.

As to the very pertinent question of medication in the cases under observation, I may answer it by saying that medicine was given an entirely subordinate part in any case under treatment. That medicine has its place goes without saying, but that it should occupy the position of paramount importance which it occupied some years ago is, in the light of modern investigation and experience, absurd.

In my cases creosote was given as a rule in one- or two- or three-drop doses in milk, after meals, as a tonic and intestinal antiseptic. It was never given with the idea that it had any great healing power over the diseased lung tissue, although through its excretion by way of the respiratory tract some antiseptic power even there may be evolved. Small doses of quinine, for their stimulating power upon leucocytosis, and for their powerfully tonic action on appetite and digestion, was frequently a recourse whenever conditions seemed to warrant.

Constant care of the digestion, and excretion through the intestinal tract, were enjoined upon all of the patients. With forced feeding in any case, free bowel action is a *sine qua non*, otherwise the effects of stagnation in the whole digestive tract become in a very short time the predominating symptom in the clinical picture.

Serum or vaccine treatment was considered only to be dismissed, inasmuch as it has no practical basis upon which to found a therapy. The opsonins may, and doubtless do, contain potentialities, but they have in no wise been reduced to a practical concrete form for the treatment of tuberculosis.

SUMMARY.

1. All cases under observation have received little treatment except rest, fresh air, and forced feeding.

2. Internal medication has been used wherever necessary, usually to meet symptoms and to cure any aberration from the normal plane of health, at the earliest possible moment.

3. All cases have been relieved of the evening rise of temperature.

4. All have gained in flesh—the maximum gain being twenty-four pounds, and the minimum five.

5. All patients have been able to resume their ordinary avocations, and have

been able to support themselves, and in some cases aid in supporting others.

6. The lung lesions have shown no striking improvement on physical exploration, but the general sense of well-being in all cases has been marked.

7. All these patients understand the condition of their lungs perfectly, all are hopeful of a cure, and all are filled with the belief that they will be cured, a belief which I, by the way, have carefully fostered.

8. All of these patients, understanding the condition of the lungs and being educated for the care of their sputum and excretions generally, are centers for a dissemination of knowledge of this white plague.

9. Only by a wide-spread dissemination of this knowledge can we ever hope to stamp out the scourge; and only by careful instruction of our patients can we hope to eliminate them as potent factors for evil through the medium of their sputum.

10. None of these cases have been cured in the year, but all have been checked, and all have been improved.

AORTIC DISEASE.

In the *British Medical Journal* of March 16, 1907, RANKIN tells us that in the treatment of aortic disease the primary object to achieve is the establishment and maintenance of sufficient compensation. In a patient, cited as an illustrative case, who suffered recently from rheumatic fever, the chances are that his compensation never became firmly established—that is to say, that the length of time over which he rested and the amount of care which was taken of him otherwise after his acute illness was not enough to build up his myocardium against the strain of his subsequent life. In addition to this he has been careless of himself, and has indulged in alcohol freely and unwisely. Consequently he comes with all the evidences of broken compensation, which fortunately for him has not gone beyond moderate pulmonary congestion. The mitral murmurs have almost disappeared; the cardiac rhythm is regular; the locomotive pulsation in the vessels has diminished, and there is a distinct though feeble second aortic sound to be heard in the carotid arteries. There is now no cough and no physical signs in the lungs; the liver dulness has become normal. He is taking food well and is sleeping comfortably in a normal position the night through. This amelioration has taken place under the influence of complete rest in bed, a simple and moderate diet, regulation of the bowels by means of salines, and an occasional small dose of calomel. At first he took a mixture of sodium salicylate, digitalis, strychnine, and ammonium carbonate; this was followed later on by another, which he is still taking, containing dilute phosphoric acid, iron perchloride, nux vomica, and strophanthus.

The only point worthy of comment in the medicinal treatment of a case of this type is the employment of digitalis. The old tradition that digitalis is a dangerous drug in aortic disease clings to many of us so pertinaciously that we hesitate to avail ourselves of its valuable assistance. This is not, the author thinks, good practice. The true action of digitalis is that of a tonic, the best of all we possess, to the myocardium. When compensation is well maintained, its exhibition is never indicated, but whenever this fails it should be called to the rescue, irrespective of the nature or situation of the valvular lesion. Not only so, but at the outset of its administration the drug may be given advantageously in bolder doses than are customarily employed. Fifteen minims of the tincture every four hours may be ordered with perfect safety, if we are careful to watch its effects and curtail the quantity when we get evidence of saturation. That evidence is forthcoming in an abnormally slow cardiac rhythm, diminished urinary secretion, and disturbance of the digestive organs. In many instances the good effects of the drug are evidenced only after these physiological effects are produced. No harm ever results if, at this stage, the drug is either temporarily withheld or its

quantity diminished to 7 or 10 minims every eight hours. Strophanthus and convallaria are recommended as valuable alternatives which are better suited to aortic conditions; but though they are useful remedies, their good effect upon the heart falls far short of digitalis, and it is by no means uncommon to find a speedy improvement under the influence of digitalis when the others have failed to bring about the least response.

Another point about the administration of digitalis which is not sufficiently recognized is the safety that may be secured by its combination with nitroglycerin. In all cases in which vascular tension is high the one-per-cent solution of nitroglycerin given along with the digitalis prevents increase of peripheral resistance, and so robs the digitalis of that influence upon the arterioles on account of which its administration is supposed to be contraindicated.

In the case of another patient, who likewise improved decidedly, the treatment has been somewhat different. His chief complaint, when first admitted, was of pain in the chest on exertion; shortness of breath, which prevented his lying down in bed at night; and recurring anginal attacks of a severe type. This is a combination of symptoms with which we are familiar, and which is enough of itself to suggest aortic disease. This case is one belonging to the degenerate type of this ailment, but in addition to the knowledge gained of his present condition from physical examination made by the author, he recalls that when first seen his pulse was one of very high tension. A leading indication for treatment was found, and in accordance with the author's usual plan in cases of this description, the patient was at once put on a mixture of potassium iodide and nitroglycerin. Both these drugs, and especially the latter, are valuable vasodilators, and under their influence this man rapidly experienced relief to his breathing and diminution in his precordial discomfort. He was kept closely confined to bed, his diet was simple and mostly "sloppy," and every night for a week he was given one grain of calomel, followed in the morning by a moderate dose of ordinary "white mixture." After ten days he was so much better that he was put on iodide of iron, strychnine, and strophanthus, and allowed a greater amount of freedom in regard both to diet and exertion. He has had no recurrence of his anginal attacks since a few days after his admission; he is now able to sleep comfortably in the ordinary recumbent position; and a moderate amount of walking exercise can be indulged in daily without producing either cardiac discomfort or undue physical fatigue.

As regards the dosage of the iodide and nitroglycerin in cases of this description, the author thinks we often err in making the quantities too small—15 grains of sodium iodide protected by 2 minims of Fowler's solution, and combined with 2 minims of the one-per-cent solution of nitroglycerin, may with perfect safety be given every four hours. Whenever the pulse becomes soft and begins to quicken, longer intervals should be allowed between the doses, and eventually the nitroglycerin may be wholly withdrawn and the iodide continued in smaller amount, say 5 grains, along with strychnine and one or other of the milder preparations of iron. In regard to calomel, its value is not confined to its aperient effect; it is a useful intestinal antiseptic as well, and also assists in diminishing the tension in the arteries. Obviously the nature of these patients' occupation is inimical to the maintenance of their circulatory balance when they return to work. They are urged to find a new field for their labors, in which exposure, muscular strain, and dietetic irregularity will enter less into their daily experience, but it is difficult for most men after middle life to embark upon a new calling, and many of the cases ultimately succumb to the circumstances of environment which is unusually trying and hard, even for those who are in the possession of full vigor and healthy organs.

EDITORIAL.

THERAPEUTICS AND COMMON SENSE.

During the last hundred years the medical profession has passed through moods which closely resemble the moods of an individual—at one time optimistic, at another pessimistic; at one time ladling out potions with undue generosity, at another time withholding all medicines on the ground that they do nothing but harm, but on certain occasions exercising common sense, recognizing that some conditions were incurable by drugs, and also fully appreciating that many remedies, if properly administered, were capable of producing much good. In the earlier part of the past century much of the pessimism in regard to the administration of drugs arose from the fact that there did not exist any adequate conception of the physiological or pathological processes which were present in the patient's body, and also because, in not a few instances, the doses which were given were so heroic as to be quite capable of producing a condition which was worse than the disease. Later, with the advances which took place in physiology, pathology, and bacteriology, the seemingly utter hopelessness of attempting to combat perverted and diseased functions staggered the practitioner and drove him into a condition in which he was prone to consider that any struggle against disease was almost hopeless. At times this pessimism has, however, been swept aside by the further discovery that many of the remedial measures which have been employed with success in the past, upon a purely empirical basis, have in reality sound scientific standing. Perhaps one of the most interesting of these is the fact that alkalies and purges of the saline class are useful in many cases of urticaria, not because, as was at one time considered, the condition of the juices of the body is acid, but because the alkalies combine with certain acids in the intestinal canal which are capable of combining, and so abstracting certain salts from the blood, which, being abstracted, cause extravasations to occur. So, too, the saline purges, such as magnesium sulphate, which was at one time supposed to do good simply by purging the intestine, are now known to do good because the magnesium increases the coagulability of the blood, and so diminishes the tendency to capillary leakage or transudation.

Many other illustrations of a similar character might be brought forward, but the real object of this editorial note is to urge our readers not to be carried away by undue enthusiasm and not to be warped and discouraged by useless pessimism; or, in other words, to hold fast to that which is right, and not to be ready to accept things as right until they are carefully thought over. One of the reasons why remedies fail to give the desired results lies in the fact that many physicians when examining a patient only seek for one cause of his illness, and having found this, are entirely satisfied with their diagnosis, entirely neglecting the fact that the symptoms presented may be due to more than one cause. Thus, in a case which recently occurred in Philadelphia, a married woman was admitted to a hospital during the third week of typhoid fever in a condition of collapse, and was supposed to be suffering from either perforation or hemorrhage from an intestinal ulcer. Abdominal section was performed, and to the amazement of the operator a ruptured extrauterine pregnancy was found to be the cause of the condition of the collapse, a condition which would have been thought of first had it not been that the patient had been ill for some time with enteric fever. Again, it is quite possible for a patient who is suffering from severe abdominal pain of the right side to have both appendicitis and cholecystitis, yet some of us would be quite content with finding

one of these conditions, and regarding it as the sole cause of the difficulty.

In connection with these remarks we have been much interested in an anonymous letter which has been sent from Paris to the *Boston Medical and Surgical Journal* of June 13, 1907, in which the writer, evidently a physician, exclaims against the common habit of practitioners of administering various extraordinary drugs to meet conditions which are popularly believed to be the cause of certain disagreeable symptoms. As he points out, the idea that uric acid is responsible for a host of morbid states was promulgated some twenty years ago, and having been accepted by physicians with an enthusiasm entirely unjustifiable, has reached the laity, who are now prone to regard every ailment as being due to this cause, when, as is well known, uric acid itself is a normal product in the body, and even when injected into the blood in considerable quantities is incapable of producing any deleterious effects or grave symptoms. Finding that lithia, when mixed with uric acid, formed a soluble urate of lithia, the conclusion was at once jumped at that lithia would be a useful thing in the so-called "uric acid diathesis" to aid in the elimination of this substance, when, as a matter of fact, the action of lithia in the body is quite different from that of its effects in the test-tube, since it has a greater predilection for the acid sodium phosphate of the blood, which fluid it may damage by taking out this important ingredient. Again, it has been freely administered whenever the physician found an excess of uric acid and urates in the urine, when, as a matter of fact, this excess in the urine showed that the patient was getting rid of an excess of uric acid. As has been pointed out repeatedly, if lithia is ever needed for uric acid, it should be given to those patients who are passing too little and not too much of this substance.

After lithia had had its vogue a rival was introduced in the shape of the more extensive product known as piperazine, which was stated to be twelve times as powerful as lithia in dissolving uric acid. Later still, lycetol appeared as a rival of piperazine, and both of these substances were for a time popular until they had been weighed in the balance. Since then a series of other uric acid solvents have been introduced.

It would seem that the time has come when the uric acid idea should receive its quietus, but as is well said by the writer that we quote, "if it were possible to kill the uric acid idea, nail it up in a coffin, and bury it under six feet of earth, it would still find means to ooze out through the pores of the wood so that the earthworms could bring it again to the surface as they do the anthrax bacilli." Once more we quote from this clever contributor when he says that "the uric acid theory seems so plausible to many persons that their mind takes the same trend as that of the woman with mammary carcinoma, who never rests until somewhere in the remote past she can remember having fallen against the corner of a piece of furniture and damaged her breast."

Finally, let us recollect, whenever we are tempted to administer remedies too freely, that, after all, drugs and remedial measures other than drugs are designed to help nature, not to force it; that in many instances nature, if left to itself, will produce cures which are so far beyond our comprehension as to be perfectly marvelous; and let us inculcate into the minds of our students and patients the fact that quiet and rest and patient waiting for nature's processes will often produce a cure most quickly, particularly if gentle remedial measures are cautiously employed. As the correspondent quoted points out, "How often do we see a dog who has overeaten himself withdraw from its customary surroundings and spend hours or days in a condition of quiet starvation until his system has combated his excesses and readjusted its mechanism. The dog has sense enough to refuse tempting articles of food at such a time. Man too frequently, when feeling ill from overeating, eats much and

takes drugs at the same time, and yet we who have not the sense or patience of the dog give this animal the somewhat insulting title of *canis vulgaris sive domesticus.*"

Let us give drugs bravely and freely when there is a good reason for their administration, and refuse to give drugs, with equal bravery, when a careful examination of the patient convinces us that he will do best without them, for the administration of drugs must be like the use of paint by the great artist, "mixed with brains" if it is to produce good results.

THE VALUE OF PICRIC ACID IN THE TREATMENT OF BURNS.

The readers of the THERAPEUTIC GAZETTE will probably remember the interesting symposium upon the treatment of burns which was contributed to the June issue. At that time we had not seen the remarkable report made by Dr. Kindleberger, a surgeon in the United States Navy, to the *Military Surgeon* upon the treatment of the burns which occurred at the time that the U. S. S. *Bennington* suffered from a boiler explosion in July, 1905, at San Diego, California. The symposium to which we refer was almost unanimous in indorsing the value of picric acid in the treatment of various forms of burns and scalds. In the report of 52 cases which were treated in the temporary Naval Hospital, which was established immediately after the disaster to which we have referred, we find that the following method of treatment was carried out:

The clothes were removed, the dirt and grease washed off with tincture of green soap and ether, and the sloughs and dead skin cut away. If the wounds had already been dressed with some oily preparation they were gently wiped with some sterile cotton, and all oozing surfaces were dried in the same manner. After this sterile gauze soaked in a one-per-cent solution of picric acid was applied to the burnt surface, covered with paraffine paper, cotton pad, and gauze bandage. If the face was burnt it was entirely covered with a gauze mask soaked in the picric acid solution. The dressings were changed each day. It was noted in particular that those cases which had been previously treated with oils and ointments, and which were admitted with burnt surfaces bathed in pus, and suffering from high fever, improved rapidly under this method of treatment. The picric acid solution caused pain for ten or fifteen minutes after it was applied, but later had an anesthetic effect, the pain being less each time the wounds were dressed.

It was pointed out in the symposium to which we have referred that picric acid solution stains the skin, and therefore surgeons and nurses are to use rubber gloves when applying it.

It is supposed that the picric acid solution by coagulating albumen aids materially in stopping oozing and pus formation, and also in preventing the absorption of toxic material. After the first few days' dressing it may be applied every other day or every third day.

After the gauze is removed the burnt part should be irrigated with picric acid solution, and if the gauze adheres it may be softened with picric acid solution before it is taken away so that it will not tear the new granulations. Where fingers or toes are burnt, layers of picric acid gauze should be placed between the parts to prevent adhesion.

In this connection it is interesting to note that in every case in which this treatment was applied on the occasion that we have spoken of, the urine was dark-red and frothy when passed, this trouble being attributed to hemoglobinuria and some carboluria. Frequent urinary analysis showed no albumin, and the discoloration of the urine was regarded as being of no importance. Those patients who had not only discolored urine but high fever at night were given small doses of magnesium sulphate for its antidotal and purgative effect.

Kindleberger concludes, as the result of his large experience, that the picric acid method is one of the best that can pos-

sibly be instituted. He also calls attention to the statement made by Surgeon Braisted of the navy in his report on the "Japanese Naval Medical and Sanitary Features of the Russo-Japanese War," to the effect that many extensive burns were treated among the Japanese by means of a solution of picric acid, though Dr. Kimura told him he intended to recommend the use of chloretone for this purpose. Finally, Kindleberger goes so far as to state that his experience shows clearly that picric acid should be the local treatment used in all burns, no matter how severe or extensive, if one wants to get a clean wound, rapid healing, diminished fever, and lessened scarring, and he regards this use of picric acid as being in the same class as the use of antitoxin in diphtheria, mercury in syphilis, and quinine in malaria.

AN OVERLOOKED METHOD BY WHICH TYPHOID FEVER IS DISTRIBUTED.

The profession of medicine has as one of its most beneficent functions the earnest endeavor on the part of its votaries not only to cure disease which is already in existence but to protect the well from illness, and it is a remarkable fact that most of the great advances which have been made in medical science within recent years have been along the line of preventive medicine, and have been chiefly devised to maintain health in the population of cities and country districts.

As we have often pointed out in these columns on other occasions, it has been proved beyond all doubt that fleas and roaches do much toward distributing typhoid and other infections, and for the last twenty years the importance of destroying the discharges of typhoid fever patients as soon as they escape from the patient's body has been well recognized, even if it has not been carefully carried out. Many physicians who are careful in regard to such matters not only insist that the patient's discharges shall be destroyed as soon as they escape from the body, but also recognize that the urine for some time after an attack of typhoid fever is often laden with enormous numbers of typhoid bacilli, and that the convalescent patient who is quite well enough to travel can therefore carry the disease from point to point, and by contaminating water or food supplies give rise to many epidemics. For the purpose of preventing this form of bacilluria, it has been well proved that the administration of urotropin or uritone is exceedingly valuable.

A remarkable instance of the ability of a person apparently in perfect health to cause repeated epidemics of typhoid fever is recorded by Dr. George A. Soper in the *Journal of the American Medical Association* of June 15, 1907. In this particular instance no less than seven outbreaks of typhoid fever, including 26 cases and one death, occurred during a period of five years, and the disease broke out in families at Oyster Bay, N. Y., Sandy Point, N. Y., at Dark Harbor, Me., in the city of New York, at Mamaroneck, N. Y., Tuxedo, N. Y., and again in the city of New York in 1907. A careful examination of the water-supply and the general sanitary conditions surrounding many of these cases proved conclusively that they could not have been developed from any ordinary source. Ultimately it was found that in these different places there was employed a woman in the capacity of cook for the family. After a large amount of detective work and the careful investigation of the entire matter by the New York City Department of Health, it was found that this woman had been present before every epidemic that developed, and believing that she had something to do with the dissemination of the disease the woman was taken into custody in the city of New York with the object of having her excretions carefully examined bacteriologically. As she refused to give her consent to the making of these examinations it was found necessary to resort to legal measures and to enforce them for the sake of the community. She was therefore removed to the Detention

Hospital after a severe struggle in which she showed remarkable bodily strength and agility. It was expected that her urine would be found to contain a large number of bacilli, but none were found in this secretion. On the other hand, her stools contained the germs in great numbers, and daily examinations made for over two weeks failed only twice to reveal the presence of the bacillus typhosus. Her blood also gave a positive Widal reaction. During the whole time the woman appeared to be in perfect health. In other words, all these years she was a chronic typhoid germ distributor, and caused an outbreak in seven of eight families in which she was employed, although she seemed to be in perfect health in every instance. As she refused to give any information in regard to her early history it was impossible to determine how long before she had been a sufferer from the disease.

The moral of this most valuable investigation is not far to seek. It emphasizes the fact to which we have already referred, that patients during convalescence from typhoid fever should always receive intestinal and urinary germicides, and should be regarded for a long time after recovery of good health as being possible sources of further illness.

THE LUNG COMPLICATIONS FOLLOWING OPERATION.

Under this title, always of fresh interest to the surgeon, Wolff (*Deutsche Zeitschrift für Chirurgie,* 88 Bd., 1-3 H., 1907) contributes an article mainly of interest because it comprises the results of experience in a single hospital—experience gained in a large service and under various methods of anesthetization. Wolff calls attention to the irritating effect which ether has upon the respiratory tract, noting that the effect is purely toxic and that it will produce an inflammation so acute as to cause suppuration even in the absence of bacterial invasion. Moreover, he quotes Poppert to the effect that as a result of ether inhalations, particularly in the concentrated form, multiple hemorrhages occur in the lung substance, often with closure of smaller bronchi. Thereafter is quoted a considerable quantity of contradictory laboratory evidence, none of it having much direct clinical bearing, with a discussion of the lung complications following narcosis, whether this be embolic, or the result of infection from material aspirated from the throat, or the result of direct inflammation caused by the anesthetic vapor. The various theories by which an attempt is made to explain the frequency of pneumonia following abdominal operations are exploited at length, together with an amazed comment on Gottstein's well-known statistics showing that pneumonia is more frequent after laparotomy performed under Schleich's anesthesia than under the use of a more general narcosis. Mikulicz is also quoted to the effect that the percentage of pneumonia after struma and belly operations, with the exception of gastrostomy, is larger after Schleich's anesthesia than after a general anesthetic.

The lung complications which may occur during and after operation are bronchitis, lobular pneumonia from aspiration, hypostasis with infection or infectious or non-infectious embolus, lobar pneumonia, abscess or gangrene of the lung, hemorrhagic embolic infarct, lung embolus, and acute edema of the lung. Hypostatic pneumonia, or that due to aspiration, usually appears within twenty-four hours, certainly within the first three or four days, often with very moderate clinical symptoms. Embolic pneumonia may not appear for one or two weeks. It is characterized by sudden onset, pain, fever and pleuritic exudate, and by suppurating, often bloody sputum. Clinical evidence is usually found between the point of the scapula and the spine.

Wolff contributes his experience based upon over three thousand operations, and notes that from 1902 to 1905 he used almost exclusively ether, the so-called Billroth's mixture. Since 1905 he has used

almost exclusively chloroform. Ether was given by means of Juillard's mask. It is often preceded in cases of belly operations by injections of morphine. Of 1806 ether narcoses there were lung complications in 96—*i.e.*, 5.3 per cent. Of 744 narcoses with chloroform and ether there were 72 lung complications—*i.e.*, 9.8 per cent.

It should be noted that the mixed narcosis was used very often in people who had inflammation of the respiratory tract. Five hundred and thirty-two operations were subject to chloroform alone; 24 of these exhibited lung complications. In other words, the smallest percentage of lung complications followed the use of chloroform.

The substitution of chloroform for ether based on this large clinical experience is in striking contrast to the practice of American surgeons. In the great majority of our clinics lung complications have practically disappeared, not by a change of anesthetics, but by a careful choice of the anesthetist, and by the open method of administering the anesthetic.

PROPHYLAXIS AND TREATMENT OF INFECTIONS OF THE PERITONEUM THROUGH THE AGENCY OF NUCLEIN.

Under this title Chantemesse, as reported in the *Klinische Therapeutische Wochenschrift,* holds that by the injection of nuclein, particularly in its acid form, combined with soda, in one-per-cent solution, the peritoneum may become so resistant to bacterial invasion that the perforations, for instance, of typhoid fever may be made completely innocuous, thus doing away entirely with the need of operative treatment, or causing the symptoms of peritonitis to advance so slowly and with so little systemic shock that intervention may be practiced without the need for haste.

Chantemesse points out the difficulty attendant upon distinguishing between the true typhoidal perforation and other conditions which may simulate it, notably a deep ulcer producing symptoms of peritonitis and associated with tympany. He finds that the subcutaneous injection of nuclein produces in six or eight hours a very pronounced mononuclear hyperleucocytosis, steadily increasing for two days and persisting for four or five days, after which this gradually lessens. The injection of one centigramme of a one-per-cent solution of nucleinate of soda into a vein causes in the course of two or three hours a slight shivering sensation with a jump in temperature. This aseptic fever lasts but a short time and is accompanied by a most pronounced leucocytosis. The dose advised for man is 40 cubic centimeters of physiological salt solution containing 0.40 of nuclein acid sodium. This injection causes pain, which the author ingenuously states may be relieved by a cataplasm containing opium, though he does not sufficiently explain how opium can produce any local analgesic effect. Not only are the leucocytes increased in number, but also the opsonic index of the blood is correspondingly modified, the author stating that in one case of typhoid perforation in which the opsonic index was 1.60 this has been raised to 2.5 twenty-four hours after the injection. At the same time the symptoms of peritonitis were rapidly retroceding. The subsequent history of this case, however, is not given. The author acknowledges that there is severe local pain, which he considers of trifling moment, as also the fever and general wretchedness following the injection. These symptoms are transitory, lasting but a few hours. Chantemesse's indorsement of these injections in the case of a strong patient who can wait twenty-four hours for an operation is unqualified. He also is inclined to advise this treatment for operations of such nature, or so complicated, as to make the development of an acute peritonitis probable. The nuclein injections are advised not only as a means of strengthening vital resistance, but are also suggested in the treatment of erysipelas and pneumonia.

This paper represents a clinical applica-

tion of certain laboratory facts, an application apparently not founded on experience and based on deductions which to say the least are far-fetched and inconclusive. There may be surgeons who would be content in the presence of a probable post-typhoidal, appendicular or cholecystic, gastric or duodenal perforation to inject 40 cubic centimeters of the acid nuclein preparation, waiting twenty-four hours for the misery of this injection to pass, and then proceed to open the abdomen with full confidence that hyperleucocytosis produced by this nuclein injection would more than compensate for the evil effects of delay. It is barely possible that some such procedure may be universally adopted. It is fortunate for the sake of science that some at least of our foreign colleagues are willing to experiment in their clinics with hypothetical questions rather than devote themselves in each individual instance to the prompt application of the best that is known for the saving of human life. It is possible that by means of nuclein injections the systemic and local resistance to injection may be greatly increased. It is scarcely conceivable that the benefit accruing from this increase can for a moment compensate for delay in operation.

REPORTS ON THERAPEUTIC PROGRESS.

SOME NOTES ON THE CONTROL OF SUPERNORMAL ARTERIAL PRESSURE.

In the course of an article on this topic in the *Lancet* of May 18, 1907, OLIVER says that when the arterial pressure is raised the principal aim in dietetic directions should be to select a diet which has the least stimulating effect on the circulatory organs. Hence we should reduce as much as possible not only the bulk of each meal but also the proportion of those constituents of the foodstuffs which more particularly stimulate the cardio-vascular apparatus, such as various salts, soluble extractives, active principles and other bodies (*e.g.*, alcohol), which are directly absorbed without change and may be regarded as exogenous hormones between the digestive tract and the circulatory apparatus, stimulating the heart on the one hand and the capillary circulation on the other.

Most observers are well agreed that the supply of meats of all kinds should be lessened below the proportion ordinarily taken, and some are satisfied merely to reduce or to disallow the red meats (beef and mutton), while they permit the taking of white and young meats (fish, poultry, veal, etc.) in ordinary quantities. Though the practitioner nearly always is inclined to select what are called lighter meats, the author has noticed no difference of effect on the arterial pressure of the various forms of roast or fried meats —whether as beef, mutton, fish, poultry, etc. A more important difference in this respect seems to him connected with the way in which the meats are cooked—whether roasted and taken with the gravy, or boiled and served without the broth. He therefore makes it a rule in these cases to substitute as much as possible boiled for the roasted or fried forms of fish, fowl, beef, mutton, etc.; and to exclude from the dietary meat extractives, such as meat soups, gravies, etc. The proportion of green vegetables and fruits should be increased and carbohydrate foods may be taken in moderation. As a rule he thinks the cases do best on the reduction of an ordinary diet as a whole, with a diminution of the animal and an increase of the vegetables derived from foodstuffs. The reduction of the ingesta to physiological needs and expenditure is particularly important in the management of cases of high arterial pressure; for some such patients who are inactive feel weak

and run down and crave for the stimulant effects of tonics and a full meat diet, with excess of salt and other condiments, and sometimes of alcoholic drinks.

The question of fluids—their nature, quantity, and best time for their ingestion—is not a matter of indifference. The bulk of the meals should be kept down by reducing the quantity of fluid taken with them. Fluid, of which the best is water, should be taken more freely when the stomach is empty—*e.g.*, a tumbler an hour before meals or night and morning. Preference should always be given to soft or distilled and non-aerated water; or to mildly alkaline waters, as potash and soda salts improve the peripheral circulation; and it is best generally to advise the water to be taken warm. Hard water—*i.e.*, water containing calcium salts in such proportion as to raise the hardness above five degrees—is best avoided, especially in the elderly with a premature rise in the arterial pressure, in whom there may be an inadequate elimination of calcium salts by the bowels and kidneys. Though calcification is generally believed to follow and not to precede degeneration or involution, it may turn out that inadequate elimination may lead to the deposition of calcium salts in the arteries, kidneys, and other tissues of the aged. As the combination of calcium with an organic acid (*e.g.*, citric) deprives the calcium ion of its specific physiological effect on the blood, the addition of lemon juice to hard water may be a useful corrective in the elderly and gouty.

The question of beverages, such as tea and coffee, is still somewhat unsettled, some observers regarding them as particularly injurious. Long-continued indulgence in strong tea and coffee is, the writer believes, injurious, but he sees no objection to these beverages in strict moderation, and when their ingestion is not followed by disturbing results, such as palpitation, flushing, giddiness, or wakefulness. As to alcoholic beverages, his impression is that high-pressure cases as a class are better without them, but that many cases of moderate or slight increments of pressure may be allowed small quantities without injurious effects, especially if, as a rule, we exclude wines and beer. There is no doubt that when the vasomotor system is intact alcohol (as in the form of whisky or gin) is a vasodilator and has but a transitory effect in raising the systolic pressure. The latest experimental work on alcohol (that of Prof. W. E. Dixon, of Cambridge) shows that in moderate doses alcohol in normal animals and in man may raise the systolic pressure a little (and especially in animals showing signs of circulatory failure), but it may fail to do so, while it diminishes the diastolic pressure ("in other words, the difference between the systolic and diastolic pressure tends to increase"), and that it increases the activity and output of the heart, an effect which is ascribed to the fact that alcohol is a readily assimilable food substance.

Chloride of sodium as a constituent of foodstuffs and as a condiment deserves some notice in the treatment of supernormal arterial pressure. The works of Widal and Javal and other continental observers have shown that superchloridation and superhydration of the tissues take place when the kidneys become impaired in their permeability to the passage of chlorides, as in chronic nephritis, and probably in other phases of renal inadequacy not recognized as organic; and that some of the manifestations of Bright's disease (*e.g.*, edema, albuminuria, etc.) are closely associated with this tissue retention of chlorides and water and are relieved by a dechloriding diet. The author is not as yet prepared to state what is the rôle, if any, which the retention of chlorides plays in the production of the high ranges of arterial pressure which we meet with in chronic interstitial nephritis. Probably it is insignificant. To apply efficiently a dechloriding diet the mere omission of salt as a condiment is insufficient. We must besides this select those articles of food which in the uncooked state contain the least percentage of salt, and omit the

addition of salt in their preparation for the table. The diet thus obtained is practically, though not absolutely, chloride-free. Such a saltless diet may consist of vegetable soups (made without meat stock), fresh green vegetables, fruits, nuts, fats (fresh butter, cream), salt-free bread, farinaceous vegetables (potatoes, rice, peas), and sugar. Dufour (in 1905), Guinin and Pater (in 1906), and Déléarde (this year) obtained excellent results from a dietary like this in scarlet fever and scarlatinal nephritis. But in chronic nephritis and in other cases of high arterial pressure such a strict chloride-free diet will scarcely be necessary, though it may perhaps be adopted with advantage for a while now and then when accessions of pressure arise. In fact, a saltless diet soon becomes so distasteful to the majority of patients that it is difficult for them to continue it for more than a week or two at a time.

A strict milk diet, sufficient in quantity to maintain the health and condition of the patient—*e.g.*, six pints a day—supplies to the system from 100 to 200 grains of salt (different authorities giving the salt percentage of milk as ranging from 1.6 to 3.0), so that such a diet is by no means saltless. Nevertheless, experience shows that a milk diet or a lactofarinaceous diet for a few weeks has sometimes an excellent effect on high arterial pressure and on the general health. Unfortunately, milk is often badly borne in these cases, especially when the bowels are inclined to constipation and the liver is inactive; but even then it may often be made to agree by adding to it citrate of soda or potash, or when there is gastric acidity, sodii bicarbonas or liquor magnesii carbonatis. But a lactovegetarian diet is more suitable in most cases; a moderate daily quantity of milk (*e.g.*, two or three pints) when taken with vegetable foodstuffs (bread, rice, green vegetables, and fruits) should not seriously raise the low percentage of ingested salt, and, moreover, it advantageously increases the proportions of the proteid and fat, especially when combined also with cream, cheese, and eggs. Cheese in moderation is perhaps the least objectionable form of proteid in these cases. Meats of all kinds contain even a smaller percentage of native chloride than that of milk; but the cardiovascular stimulant effect of the extractives which they contain more than counterbalances any advantage they possess in their relatively low percentage of salt. Boiled meats, however, containing less salt and extractives than roast meat may be added to the dietary without disturbing its comparatively salt-free character. Fresh-water fish (such as trout, tench, pike, and crayfish), which contain much less salt than salt-water fish, may also be taken if we do not require to adhere to a strict minimum supply of ingested salt. The condiments—pepper, mustard, vinegar, lemon, etc.—none of which are contraindicated, are useful in relieving the insipidity of the dechloriding diet.

THE TREATMENT OF DELIRIUM TREMENS.

EICHELBERG (*Münchener medicinische Wochenschrift*, May 14, 1907) reports 1574 cases of delirium tremens treated in the service of Dr. Nonne in the Hamburg Expendorf Hospital. Of this number about two-thirds were uncomplicated. The mortality of the entire series was 5.5 per cent, which is very favorable in comparison with other statistics.

No specific treatment is employed at present, as no good results were obtained with the various hypnotics, nor from those hydrotherapeutic measures generally recommended. Alcohol is withdrawn immediately in all cases except those complicated with pneumonia. The principal thing to which attention is directed is the maintenance of the heart's action. As soon as the pulse shows signs of failure, digitalis, strophanthus, camphor, or caffeine is freely administered. On the third day, when the delirium usually begins to wane, 2 to 4 grammes of chloralamid is given. This results in a more protracted period of sleep, which, however, usually comes on sponta-

neously about this time. It is only in exceptional cases that it becomes necessary to isolate patients because of violence.

SUPRARENAL GLANDS AND OSTEOMALACIA.

Professor Bossi continues the interesting observations which he made in regard to the curative action of adrenalin in osteomalacia (see *Centralblatt für Gynäkologie*, 1907, No. 3, and in No. 6 of the same periodical). The patient who was treated first has given birth, in the meantime, to healthy twins. The childbirth was normal; the patient is nursing the twins and is in the best of health. Professor Bossi is of the opinion that he owes this success solely to the extract of the suprarenal glands.

Shortly thereafter another case of osteomalacia, in the sixth month of pregnancy, was received at the clinic. She was scarcely able to stand, and all attempts to move and walk produced great pain. The pelvis exhibited markedly the osteomalacial deformities, so that the distance between the tuberosities measured 4 centimeters. After the adrenalin treatment was resorted to (in this case injections of about 1 Cc. of a one-percent solution of adrenalin chloride were made) there was immediate improvement, and in twelve days the patient was free from pain and began to walk about. The treatment was continued.

In consequence of experiments on animals (sheep), which he made to complete his observations at the sick bed, Bossi is inclined to believe that there is a connection between the removal of the suprarenal glands and the etiology of osteomalacia.

THE TREATMENT OF GASTRIC ULCER.

In the *Dublin Journal of the Medical Sciences* for March, 1907, Little reminds us that the three events which gravely compromise the safety of the patient who suffers from gastric ulcer are persistent vomiting, hemorrhage, and perforation. The terms of the discussion forbid the consideration of the last, and therefore the author devotes the remainder of his article to the other two.

Persistent sickness and vomiting are occasionally difficult to control. Looking back on the cases he has seen, the author would say the first thing is generally to try for twenty-four hours to nourish the patient entirely by rectal feeding; but this does not always succeed, and, indeed, he has not the faith in rectal feeding which is entertained by some. Absolute abstinence from milk is, he thinks, the most important advice. He has seen intractable vomiting cease when milk was given up.

The next thing which all the nurses who have worked with the author have been taught to do, not only in the vomiting of gastric ulcer, but in urgent sickness arising under other conditions, is to give half a teaspoonful of bicarbonate of sodium in half a tumbler of water, as hot as is comfortable, to the patient; if the first draught of this kind is thrown up he gives it again, and if this fails he tries another remedy.

Essence of chicken in teaspoonful doses often stops vomiting; a pill containing one-sixth of a grain of cocaine is sometimes successful; five minims of tincture of nux vomica, or a teaspoonful of granular citrated caffeine in a claretglassful of water, or a morsel of stale bread washed down by a wineglassful of champagne, are all remedies with which the author has had actual and favorable experience. If the patient is not only sick, but restless and sleepless, he has given one-sixth of a grain of sulphate of morphine with one two-hundredth of a grain of sulphate of atropine hypodermically, and he does not remember any case in which the morphine subsequently caused its own peculiar nausea.

Of some remedies frequently used, such as ice, creosote, and prussic acid, the author has no favorable experience.

In the beginning of his communication the author states that he has never seen a death in gastric ulcer due to hemorrhage, and therefore thinks that such remedies as surgical interference for hematemesis can

seldom be required. What he has observed to be most useful was either a hypodermic of morphine and atropine or the introduction of a quarter of a grain of morphine into the rectum. The use of morphine after a severe hemorrhage, however, he thinks, requires caution (many years ago he saw a case in which death seemed immediately due to a not very large injection of morphine in a patient who had vomited a great quantity of blood, owing to cirrhosis of the liver), just as the use of morphine and of hyoscine requires more than usual caution when a patient, from any cause, has had very little food. The morphine, absolute quiet, and rectal feeding have been the means he has for many years employed, and since he saw the value of adrenalin in the hands of his surgical colleagues he has always given twenty minims of Parke, Davis & Co.'s chloride of adrenalin in a teaspoonful of cold water. It seems to him useful. Another remedy in which he still retains some faith is turpentine; ten or twenty minims may be given in capsule.

With regard to the administration of ice and the injection of ergotin, the author cannot conceive of their doing anything but harm.

ON THE USE OF CALCIUM SALTS AS CARDIAC TONICS IN PNEUMONIA AND HEART DISEASE.

Sir LAUDER BRUNTON in the *British Medical Journal* of March 16, 1907, writes that fifteen years ago, in the *British Medical Journal* of January 23, 1892, he published a paper on the use of oxygen and strychnine in pneumonia. This paper was hurriedly put together, half of it having been written in a country house while watching a case of pneumonia, and the other half scribbled in a railway train on Dr. Brunton's way back. The reason for the hurried publication was the prevalence of pneumonia at the time, and the hope that the treatment which they found so promising might prove useful in the hands of others. The event has justified their expectation, and the treatment of pneumonia by oxygen and strychnine is now widely and successfully employed. A similar reason induces Brunton to write this short paper on the use of calcium salts, because in the present epidemic of postinfluenzal pneumonia there seems to be a great tendency to cardiac failure, and this, he thinks, may to some extent be averted by the free use of calcium salts, which have a tonic action upon the heart.

Nearly twenty-five years ago Dr. Sydney Ringer discovered that when the frog's heart is perfused with a solution of sodium chloride in distilled water the heart soon loses its power of contraction. This result does not occur if the solution is made with tap water. Professor Ringer's scientific acumen soon led him to the important discovery that the maintenance of the contractibility of the heart when tap water is used is due to the calcium salts contained in the water. This discovery is constantly utilized in physiological laboratories, but, so far as is known, has not had any practical application in medical treatment.

A good many months ago Dr. Brunton was called to see a case of pneumonia, and, fearing that the heart would fail, he thought over all the remedies which were likely to avert such an unfortunate result. It then occurred to him that calcium chloride ought to be useful. The only harm it was likely to do was to increase the coagulability of the blood, but any risk of this sort was small in comparison to that from cardiac failure, so he prescribed it. It is not so easy to judge of the usefulness of calcium salts in threatened cardiac failure as it is of the action of oxygen and strychnine, because the results are not so immediately apparent. As the patient for whom he prescribed the calcium made a good recovery he was encouraged to give it again, and has done so in a considerable number of cases. In some of them a fatal result has ensued in spite of everything that could be done, but in a number of them the effects appear so encouraging as to deserve a wider trial for the medicine. He usually gives it in 5- to 10-grain doses every four hours, simply dissolved

in water. As it is very deliquescent it can only be kept in solution. It has a very disagreeable saline taste, but this is well covered by saccharin; one minim of the elixir of saccharin, containing one-twentieth of a grain of saccharin, is sufficient to cover the taste of 10 grains of calcium chloride. This mixture may be given either in water or in milk, and it does not interfere with the use of any other remedies.

Brunton has also used it in cardiac disease, where the ventricular wall appeared to be losing power, and here also the results have been encouraging. In cases of pneumonia, in which one wishes to get rapid action, he thinks the chloride is the best salt of calcium, but in cardiac disease other salts may be employed, such as the lactophosphate or the glycerophosphate. It is quite possible that the great benefit one frequently observes from a milk diet in cases of heart disease may be due, in part at least, to the large quantity of calcium salts which the milk contains.

At the present moment, when there is a good deal of antivivisection agitation, it may be interesting to note that the plan of treatment by oxygen and strychnine recommended by Dr. Prickett and Dr. Brunton fifteen years ago, and the one which Brunton now recommends, both owe their origin to laboratory experiments, and any benefits which may result to patients from either plan must be regarded as the fruits of experiments upon animals.

THE RECENT TREATMENT OF HAY-FEVER.

CURTIS in an article in the *Journal of the American Medical Association* of July 13, 1907, says that a careful study of the facts at his disposal leads him to the following conclusions:

1. Hay-fever is a disorder amenable to no specific treatment.

2. The number of cases of hyperesthetic rhinitis from other causes than ragweed and other pollens is about one-third of the total number.

3. About one-third of the cases supposed to be due to pollen reaction may be relieved by constitutional and surgical methods of treatment. Predisposition to attack in these cases being due to definite causes, the author suggests the theory that induced enervation of the sympathetic is an important etiologic factor.

4. Primary intoxications may take place from pollen toxins in cases in which the sympathetic system apparently is not previously enervated. These cases, theoretically, should react to antitoxin treatment.

5. The consensus of opinion to-day is against the claims made for pollantin, though observers who have been instructed personally by Professor Dunbar indorse unqualifiedly the great benefit to be derived from the treatment.

6. Medically the suprarenal capsule products hold the first place to-day in the treatment of hyperesthetic rhinitis.

7. The constitutional treatment as an adjunct to any local application is of supreme importance.

8. The best of all treatments yet found is the climatic, with previous attention to nasal conditions.

THE TREATMENT OF MALARIA.

KRAUSS, in the *Journal of the American Medical Association* of March 16, 1907, considers the therapy of this infection only in so far as it has a bearing on the eradication of the endemic. If such a patient is put to bed and placed under the best hygienic conditions, given eliminatives, followed by arsenic, and the malarial leucocyte variation disappears, he may be considered as cured. If hemamebæ appear in the peripheral circulation during this time, tentative doses of quinine may be given to try the hemolytic reaction, and then larger doses until a cure is effected. The time to give quinine, and the only time, is when developing parasites are found in the peripheral blood, provided, further, that the infection is fresh, as evidenced by a characteristic fever curve; otherwise a preliminary purge is absolutely demanded. It is not necessary to salivate your patients

or to give calomel to all of them. In the autumn it is the author's routine practice, so far as he employs routine, to give two or three 10- or 15-gramme doses of sodium thiosulphate at desirable intervals until the bowels are freely emptied. Pernicious cases must, of course, be treated more expeditiously, and if acute perniciousness supervenes on chronicity, it is better to take chances with intravenous medication; there is slight probability of the patient recovering in any event.

If acute paroxysmal malarias are properly handled with a persistent follow-up treatment, such a condition cannot develop, and the most prolific source of the season's infection is definitely eradicated. The prophylaxis of malaria and its definite local eradication depend alone on the complete cure of our malarial fevers. The small percentage of natives who do not have paroxysms or distinct evidences of the infection should have their blood examined occasionally. Two objections are urged against this plan: (1) The patient will object on the ground of expense and impracticability; (2) there are few skilled microscopists in the country.

As an economical proposition, bearing in mind that each malarial paroxysm adds to the sum of pathologic changes, more or less permanent, and that many disorders, progressively fatal, are mistaken in the beginning as "just a touch of malaria," is it cheaper to spend weeks and months vainly trying to regain health, or to have oneself looked over from time to time?

As to the second objection, thirty years ago it would have been regarded as the height of extravagance for a business house to employ a stenographer; to-day it is a small concern that does not require a number of them; to-day there are laparotomists in the country, telephones, electric light, water-works, and trolley cars, and as soon as practitioners learn to appreciate the necessity for skilled microscopists they will have them also. Almost every patient with malaria in the writer's charity service during the last quarter (July to October, 1906) had his blood examined before the treatment was begun; the temporary illness of an assistant is the only excuse for the "almost." One death occurred in this service —a man brought in comatose, who died within two hours. In looking over the annual reports of a local hospital the author finds this classification: Various forms of malaria, 857 cases, 15 deaths. The following is but little better:

	Cases.		Cases.
Estivo-autumnal	95	Pernicious	6
Intermittent	34	Toxemia	4
Remittent	21	Tertian	364

In this list some visiting physicians made an attempt to classify their fevers properly, and the others did haphazard guesswork. Among these the writer found, at random, two cases of the quartan type, one being associated with the estivo-autumnal type. Here there were 16 deaths.

If it is borne in mind that of all fevers, malarial is the most tractable, what excuse have we to offer for a hospital death-rate of from 2 to 6 per cent? And if we bear in mind that the disease is absolutely preventable, how can we complacently look on a ratio of 11 per cent to the total number of deaths?

The writer holds that such a state of affairs is absolutely unjustifiable, but the worst is yet to come. It is safe to assert that not one of these patients has been instructed in the matter of his responsibility to his fellow man in respect to harboring malarial organisms.

Krauss concludes as follows:

1. There is not the shadow of an excuse for failure to make an exact diagnosis in all fever cases.

2. The blood of residents of malarious localities should be examined at frequent intervals. This does not constitute an encroachment on personal liberty that can weigh a feather's weight as compared with vaccination.

3. Fever cases should be treated in accordance with the findings of a thorough blood examination, with especial reference to time of dosage, and to the complete immunization of the individual for the sake of his neighbors.

4. Quinine judiciously used in accord-

ance with the findings of a blood examination very rarely does harm; its prohibition on the ground of possibly precipitating a hemoglobinuria is unpardonable; its administration during hemoglobinuria is very dangerous and usually unnecessary; a blood examination will save such patients from almost certain death.

5. The screening of houses and the destruction of breeding places of anopheles should be encouraged so far as possible, but the prophylaxis of malaria and its definite local eradication depend on the destruction of the parasite within its alternative host, man.

THE PASSAGE OF METHYLENE BLUE FROM THE MATERNAL TO THE FETAL CIRCULATION.

In the *Journal of the American Medical Association* of March 16, 1907, CORRIGAN says that failure to find record of any similar observation in the study of placento-maternal circulation would seem sufficient reason for submitting the following:

A woman, three months' pregnant, suffering from a chronic cystitis, was given a capsule of a methylene blue compound. As the medicine produced almost complete relief of her symptoms, the patient continued taking it up to the time of her delivery, at full term. The average dose given her was three grains of the methylene blue daily. At delivery the baby, an unusually vigorous child, attracted no special attention, but when the nurse was removing the first diaper she noticed a blue stain on the cotton; each subsequent change of diaper during the first eighty hours after birth gave evidence of methylene blue in the infant's urine, the color gradually disappearing. Nothing else unusual was found in the baby's condition. It was noticed that the liquor amnii showed no unusual color; careful inspection of the sheets and pads used during labor failed to show any trace of color from methylene blue.

From these observations the author ventures to assert:

1. Methylene blue passes from the circulation of the mother to that of the fetus.

2. Either the amount thus passing is an exceedingly small portion of the drug absorbed by the mother or the drug passes from mother to child, and *vice versa*.

During six months the mother received into her stomach about nine drachms of methylene blue, while an estimate based roughly on the amount of colored urine passed by the infant would place the quantity of the drug in the child's body at time of birth not above one grain.

3. There being no evidence of methylene blue in the liquor amnii the fetus does not evacuate the bladder, and the liquor amnii accordingly is in no degree composed of fetal urine.

4. The kidneys of the child *in utero* do not secrete urine beyond that found in the bladder at the time of delivery, or if they do secrete urine beyond this amount, they do not excrete methylene blue, which may be in the fetal circulation.

The first evacuation of the bladder in this case, occurring very shortly after birth, produced the characteristic stain. So it would seem that the kidneys not only secreted urine but also secreted methylene blue, while the child was still *in utero*, but not more than that contained in the bladder at the time of delivery.

THE USE OF ANTIPYRIN AS A SEDATIVE IN SOME OF THE COMMON DISORDERS OF INFANCY AND CHILDHOOD.

In a paper bearing this title in the *Practitioner* for April, 1907, FLETCHER in speaking of an epidemic of whooping-cough tells us that various sedative drugs, such as belladonna, potassium bromide, chloral, antipyrin, etc., were tried in conjunction with an expectorant mixture. The usual experience was met with, viz., that one drug would often influence a case in which the others almost entirely failed. But of all the drugs tried, undoubtedly the most serviceable was antipyrin.

In no case could it be said to have cut short the disease, but it usually influenced the paroxysms of coughing and the vomiting following them in a marked manner. For the latter, in the present epidemic, at

any rate, it was practically a specific. It seldom failed after two or three doses to stop the vomiting, and that even in cases in which it did not appear to influence the paroxysms themselves. In most instances, however, the paroxysms were considerably modified. After several doses of 1 or 2 grains, given every four to six hours, the frequency would diminish to half or even less. By doubling the dose at bedtime, a comparatively quiet night's rest was often obtained. As a result it was, in many cases, easier to maintain the nutrition of the little patient, his strength was conserved, sleep was uninterrupted, and we may reasonably infer that the damage to the lung tissue was slighter. The dose usually found efficient has been from 1 to 3 grains, four to six times daily, according to the age of the child and the severity of the attack.

The beneficial action of antipyrin as a sedative is well exemplified in its effect on the nervous irritability which frequently accompanies teething. Although many of the ailments which occur during the first dentition, and which are frequently ascribed to it, are in reality due to entirely different causes, such as improper feeding, rickets, etc., yet there remains a proportion of cases, characterized by nervous irritability, pain, sleeplessness, and the like, which, if not actually due to the cutting of the teeth, are at least intimately associated with it. And it is here that antipyrin, given in doses of 1 to 2 grains two or three times daily, produces such good results. The occurrence of a certain number of cases in which the eruption of each new tooth, or set of teeth, is accompanied definitely and regularly by vomiting, diarrhea or cough, and occasionally eczema, suggests that teething may be the predisposing cause. Its action may be reflex, or may determine for the time such nervous instability that slight irritation in the respiratory tract, or in the alimentary canal, will produce effects quite out of proportion to its magnitude. In several such cases the symptoms have been checked by the employment of antipyrin alone; in others it must be confessed that it has had little effect, probably owing to the fact that the cause lay elsewhere. This heightened irritability of dentition occurs especially in children of a nervous diathesis. It is also characteristic of rickets, and although the nervous symptoms occurring during the dentition of a rachitic child should first of all be treated on antirachitic lines, yet they will be more rapidly and effectively alleviated by small doses of antipyrin.

In three cases of night terrors in which antipyrin was used, the results were so striking that they were worthy of record.

THE SURGICAL TREATMENT OF NEPHRITIDES.

If we are to accept Pousson's teachings, the advantages of the surgical treatment of acute and chronic nephritis must be evident to any one conversant with the physiology and pathology of the kidney. Surgical treatment is indicated both in acute and chronic nephritis, but for different reasons the advantages offered by operation in each condition should be examined. In acute nephritis it would appear that nephrotomy realizes three fundamental indications for its cure, namely, drainage, removal of congestion, and sepsis. It certainly must be admitted that congestion is the initial stage of all nephritides, and by splitting the kidney the organ can be bled to any extent, while by the use of the drainage tubes it may be rendered aseptic, and in reality this drainage is practically ideal. If the question is raised as to what we render aseptic and what we drain in a tissue having no tendency to suppurate, as is the case in all forms of medical nephritis, it at once becomes evident that the above propositions do not hold good.

Another objection which may be raised is that acute nephritis usually involves both glands; consequently it would seem only logical to do a nephrotomy on each, and this very point shows to what extent we are ignorant in renal pathology. However, as time goes on surgeons have practically shown that acute unilateral nephritis certainly exists and perhaps to a considerable

extent, so much so that Weir found it in 17 per cent of his cases. Then, again, Lennander believes that a unilateral nephritis is much more frequent than has heretofore been thought, and certainly no one can refute this claim. Consequently, it appears evident that frequently only one kidney is involved in the process.

The next question which arises is how to diagnose a unilateral nephritis, and here a modern diagnostic triumph comes forward, namely, cystoscopy, segregation of the urine, and catheterization of the ureters. Then, again, it should be recalled that the diseased kidney is frequently spontaneously painful and also increased in size. But now when both kidneys are the seat of acute nephritis a bilateral nephrotomy may be undertaken, or if one is not sufficiently surgically inclined, nephrotomy on one organ may be done, and according to many writers one will have had the satisfaction to have fulfilled the three fundamental indications of modern surgery, while a supposed reno-renal reflex will attend to the rest. Now all this gives a mortality of about 44 per cent, but it should be pointed out that in the large majority of cases reported so far the patients were in a desperate condition at the time operation was undertaken, and if they had been operated on earlier their lives might have been saved, or at least more successful outcomes would have been certain to have occurred.

Referring now to the surgical treatment of chronic nephritides, the author particularly considers decapsulation as advised and practiced by Edebohls and others. In chronic nephritis the renal lesion is definite, usually sclerosis has invaded the intertubular and interglomerular spaces, while the important structures of the organ are compressed and sclerotic, at least as far as the glomerulæ are concerned. The only resource offered by therapeutics is a diet allowing sufficient nourishment for the organism and a thorough washing out of the urinary apparatus, but it may be said that chronic nephritis is incurable medically.

Some surgeons at the present uphold the view that chronic nephritis can be radically cured by nephrotomy, or better still, by renal decapsulation. If the kidney continues its atrophic process the reason is that its retracting capsule compresses it too tightly, and if the latter be incised and freed from the renal structures the kidney will return to its normal condition. They also uphold the view that the poor irrigation of the kidneys is due to the capsule compressing the arteries, and if the former be incised not only will the arteries again take on their normal caliber, but a new vascular formation will take place in the kidney, so that irrigation of the organ will be complete.

As may be seen, physiologic pathology is fulfilled by this means, but there are certain objections. In point of fact, who has ever seen a profoundly sclerotic tissue return to a normal morphology? We believe that no one has. Then, again, who has seen a neovascularization develop in a kidney after decapsulation? Tuffier, who thought that this neovascularization might be expected when he was making attempts at renal graft, on the contrary found that there was less vascularization in the newly formed perirenal cicatricial tissue than in the primarily sclerosed capsule, while Claude, in repeating the same experiments, came to the same conclusion.

Now, leaving aside all these *a priori* considerations, if we simply examine the operative results our last illusions will be destroyed. In the first place those cases of renal decapsulation which have been reported are incomplete, and one is obliged to take the word of the writer when a successful outcome is announced. It goes without saying that the good faith of the writer cannot be incriminated, but how can one judge of the seriousness of the cases which they have operated on? There is nothing more difficult than to formulate the prognosis in a case of Bright's disease and say that such and such a patient will live such and such a time; to make such an affirmation the case must have been studied for a long time. Edebohls states that he has had a mortality of 17 per cent, but here again the cases have been given altogether and more detail is necessary.

Not long ago Pippel advised decapsulation in cases of eclampsia. It is quite true that this writer has shown no conclusive fact upon which to uphold his views, for he simply bases his conclusions on pathologic findings, believing that an examination of kidneys in a laboratory is sufficient to justify his proposition. However, let it be said that still more recently Pousson and Chambrelent have recorded a successful case of operation by nephrotomy in eclampsia.

Evidently one should be skeptical in the case of *a priori* criticisms. However, there is enough evidence at present which tends to show that in properly selected cases benefit may be derived from surgical interference in cases of chronic Bright's disease.—*American Journal of Urology*, March, 1907.

CLINICAL OBSERVATIONS AND EXPERIENCES IN THE TREATMENT OF LOBAR PNEUMONIA.

AFFLECK in the *Scottish Medical and Surgical Journal* for April, 1907, points out that dyspnea in pneumonia is connected with a variety of causes—a toxic action upon the respiratory center, the pain, the extent of lung involved, the condition of the other lung, and in a very special manner the state of the heart. In its most serious form it is apt to occur far on in the case, when cyanosis or duskiness makes its appearance. If accompanied with coarse, moist râles, with little cough and no expectoration, it is certainly of evil omen, and treatment is but too often of little avail. Diffusible stimuli, such as compound spirit of ether with aromatic spirit of ammonia, may give some relief. It is in such circumstances that oxygen inhalation is often resorted to; and this remedy, when first introduced for this purpose, seemed to give promise of great usefulness. More extended experience, however, has apparently lessened confidence in its efficacy, and it cannot be said to occupy the high place in the therapeutics of pneumonia that it once did. The author's experience of its use has not been small, and upon the whole the results have been disappointing, notwithstanding that in some notable instances it acted beneficially. It is in consequence of such occasional successes that one feels constrained to give it a trial in the more serious cases of pneumonia. It is never to be forgotten that an ample supply and renewal of fresh air in the room is most essential, and is best secured by an open window.

Treatment directed to the heart must ever hold a prominent place. Such treatment is generally reserved for that period in the progress of a case in which there is a lowering of blood-pressure and a pulse which shows evidences of feebleness, dicrotism, or irregularity. Digitalis, strophanthus, strychnine, and alcohol are the remedies usually employed to combat this condition. The author has found the two most potent to be digitalis and strychnine. The former may be given pretty freely if the effect is watched, but it is doubtful whether the large doses (a drachm of the tincture) some have recommended are really of much service. Strychnine is most efficacious when administered hypodermically. It is a question whether the tendency is not to the too frequent repetition of these strong drugs, particularly when the case is assuming serious characters, and whether more harm may not be produced than good.

The question of alcohol in pneumonia has been a much debated one. There can be little doubt that the same value does not now attach to its use as a heart supporter in this disease as it once did. Indeed, many now believe that it is unnecessary in most cases, and that even where it appears to be indicated, as in the case of the aged and feeble, its employment in any but small amount may be hurtful. While far from denying it a place in the therapeutics of pneumonia, the author holds to the view now expressed, and he believes it to be inferior in value to strychnine for the heart. This latter agent he has sometimes thought might often be administered earlier in the course of the disease with advantage, and he has occasionally begun its use whenever the case came under observation, with good effect.

The treatment of insomnia is often at-

tended with difficulty and disappointment, a remedy which succeeded in one case, hopelessly failing in another. Paraldehyde in full doses given by the mouth or rectum succeeds with a good many, and in alcoholic cases is one of the best hypnotics. Chloral along with digitalis he has known to answer particularly well. Sulphonal, trional, and veronal occasionally succeed, but are less trustworthy, and the same may be said of the bromides and also of alcohol. Opium in any form or any dose he rather shrinks from administering in the advancing or advanced stage of a pneumonia, having seen on more than one occasion reason to regret its having been used.

Delirium, if of moderate amount, can often be controlled by some of those remedies suitable for insomnia. But in the more active forms other measures have to be resorted to. The application of an ice-bag to the head, when tolerated, may be of service. In cases showing great excitement the author has used hyoscine with success so far as calming the patient was concerned; but, as already stated, such cases are very often fatal.

The pyrexia of pneumonia does not often call for special treatment. When the temperature runs high much comfort may be afforded by sponging such parts of the body as can be readily gained access to with tepid or cold water. The temperature may be lowered a little in this way, and the procedure is by no means unpleasant to the feverish patient. Antipyretic drugs are not advisable from their heart-depressing tendency. Even quinine may produce a considerable amount of cardiac disturbance.

CHLORETONE AND ITS USES, ESPECIALLY IN CHOREA.

WYNTER writes under this title in the *Lancet* of March 30, 1907. He states that on account of its local anesthetic effect he was prompted to employ this drug in painful and irritable conditions of the stomach, such as gastritis, cancer, gastrodynia, ulcer, and especially in those cases of pain, vomiting, and hematemesis so frequently associated with chlorosis, and scarcely yet completely removed from the category of gastric ulcer, with which they are by no means identical. In doses of five grains or more in petroleum emulsion it has a remarkably soothing effect both on pain and vomiting, and exercises a deterring influence on fermentation, resembling in this carbolic acid. It was while using chloretone for this purpose that its hypnotic effect became apparent, and the author has since employed it in ten-grain doses simply to procure sleep, though the state of quietude induced by the smaller doses is itself a very great alleviation of painful and protracted illness, such as the gastric conditions to which reference has just been made.

The local anesthetic effects have been found of value in vaginal pruritus as exercised by a 0.4-per-cent solution in warm water, or by five-grain suppositories in hemorrhoids. The sedative effect on the brain, similar to that of the bromides but more rapidly induced, associated as it is with a similar effect on the stomach, led to its early employment for seasickness, and it is in connection with this distressing malady that its reputation has chiefly been established. Five grains in powder taken a quarter of an hour before embarking will generally insure complete immunity from sickness during the Channel passage, even in rough weather, and the drug does not appear to lose its efficacy by repetition, as is the case with some others. A young French lady, who was invariably ill during the crossing to Dieppe, since being fortified with chloretone has only once suffered, and that in a way which suggests a useful hint in prescribing. Having performed the outward journey *tute, cito et jucunde* under the influence of one of the five-grain powders, of which she was provided with four, the other three were carefully deposited in a purse against her return after the summer holiday. Then accompanied by a friend, to whom she promised immunity from the discomforts of the sea on the strength of this new remedy, she confidently embarked and proceeded to share the remaining doses. One paper after another

was opened, but all were empty. In the hot weather the chloretone had evaporated and vanished, leaving nothing behind but disappointment and the prospect of a miserable voyage, which was amply verified in both cases. As negative evidence this was distinctive testimony to the value of the drug, and has been subsequently remedied by enclosing it in impervious wrappers such as paraffin paper.

When taken at intervals in similar doses longer voyages have been undertaken without discomfort—such, for instance, as that across the Atlantic. The drug was taken about twenty minutes before meals two or three times a day during rough weather, and the journey was completed without a qualm. A more general knowledge of this remedy will certainly save a large amount of discomfort, and in those who suffer continuously will enable journeys to be undertaken which were formerly dangerous or actually impossible.

The author has dwelt upon these effects of chloretone as they have led up to its employment in another class of cases for which we have hitherto possessed no effectual remedy. He refers to chorea. During the past twelve months the opportunity has occurred of exhibiting the drug in some 14 cases, and the result has been so striking and uniform that though the number is small it is worth making known that those who have wider opportunities may further test its reliability. In these cases, both boys and girls between the ages of seven and twelve years, five grains of chloretone in half an ounce of petroleum emulsion was given three times a day for two and sometimes three days; there was in all of them such a marked diminution of the choreic movements that the dose was then halved and sometimes given only twice and even once a day, according to the severity and progress of the case. The number of days in which the drug was continued varied from five to ten, by which time it was omitted, and either steel wine with arsenic or cod-liver oil was substituted to meet the anemia and feebleness which usually accompanied the disease. Under this treatment the duration of choreic movements was limited to nine days, and the stay in hospital to three weeks on an average. This is a great advance in the treatment of chorea, which even with the advantage of hospital régime usually extended to double and treble that time. These advantages consist of rest in bed, with isolation and liberal dietary. When convalescing the patients were encouraged to knit or crochet, or to use the hands in some such manner, so as to practice purposive movements and also as a test of steadiness.

Many patients on admission were unable to feed themselves, experienced considerable difficulty in speech, and in some cases needed padding in their cots to prevent bruising in their uncontrolled movements. It was found that those cases which came under treatment early benefited most. Of the 14 which took chloretone, two were removed from the hospital before they were quite recovered on account of contracting rötheln, and two others resisted the treatment for a longer time—a girl aged ten years, who had suffered from chorea for three years with short remissions, and another girl aged seven years, who after four months' chorea before admission appeared rather to be cured by the relief of constipation, which had been a marked feature, this being effected in twenty-one days.

With any comparatively new drug exerting marked beneficial effects the question always arises as to drawbacks, and in the present instance there are some, though not of serious account. Two of the cases exhibited exfoliation of the skin on the hands and heels which gave rise to a suspicion of scarlet fever—one after ten days in hospital without fever or rash, and the other shortly after removal on account of rötheln, of which there had been an outbreak in the hospital. The other 12 cases did not show this, and the retention of one such case in the hospital and subsequent removal to the convalescent home did not lead to communication of scarlet fever to any one else, so this exfoliation of the skin may be regarded as an occasional effect of the drug.

In two of the earlier cases treated, possibly owing to the physiological effect of

chloretone being carried rather too far, there was marked somnolence, the child lying in any attitude in which he was placed and rousing only to take food. This passed off in a few hours on discontinuing the drug.

As regards the permanency of the cure further experience is required; one of the cases cited was readmitted in about three months with a relapse, and on the other hand another was successfully treated which had relapsed after treatment by arsenic. Like the treatment of rheumatism by salicylates, the effect of the specific drug requires to be followed by a tonic régime in most cases, since the little patients are usually anemic and feeble in addition to suffering from the spasmodic movements. Where endocarditis coexists salicylates can be combined with the chloretone or may be applied to the skin instead, but for the chorea itself chloretone appears to be as much a specific as the salicylates have come to be regarded in rheumatism.

THE TREATMENT OF RICKETS.

SUTHERLAND says in the *Clinical Journal* of March 13, 1907, with regard to medical treatment, that he must speak first of all about cleansing the alimentary canal in the treatment of rickets. The intestinal tone is not normal, and it is of advantage, he thinks, to give a tonic. One can give a couple of minims of tincture of nux vomica, five minims of tincture of rhubarb, and three or four grains of sulphocarbolate of soda. These help to keep up the healthy action of the bowels. The great drug which we depend upon is cod-liver oil. Other drugs have been tried, such as mineral and vegetable oils, but they do not seem to have the same beneficial effect which one obtains from animal oil. Certainly cod-liver oil takes the first place.

Some children of nine to twelve months old will take plain cod-liver oil, half a drachm to one drachm three times a day. In others, however, the palate is more particular, and they prefer a mixture of cod-liver oil and malt, equal parts. Medicinally, the author thinks the best preparation in these cases is an emulsion of cod-liver oil and hypophosphites. He recommends half a drachm of cod-liver oil and half a grain each of hypophosphite of lime and hypophosphite of soda, which can be flavored with oil of cassia, one-tenth minim, and made up with glycerin and tragacanth to one drachm. One starts with this, and increases the dose according to the powers of digestion. It should be kept up for some time. That is the important point—the treatment must be kept up for a considerable length of time. We are not dealing with an acute affection, but with a particularly chronic one.

There are the special rickety complications. As already stated, the whole brunt of the disease seems sometimes to fall upon one system more especially. The first system the author refers to is the respiratory. Rachitic children are especially liable to bronchitis. If it is acute bronchitis, of course that must be treated in the ordinary way for a time, until the acute stage is over. One wants to find out what is the cause of the bronchitis. In rachitic children there is a marked tendency to hypertrophy of the adenoid tissue in the nasopharynx, and we must look out for that and correct it if necessary, because as long as there is blocking of the upper respiratory passages the tendency to bronchitis will be perpetuated. We must also pay special attention to the surroundings from the point of view of hygiene, and see that the child is not living in hot, stuffy rooms. Another factor is the question of adiposity. If we find that the rachitic infant is extremely fat, then in that condition of fatness will be found a cause for the bronchitis. We can understand what an impediment to the circulation through the capillaries the presence of a large amount of fatty tissue is, and how the blood is driven with great difficulty through the oily tissue. As the result of this there tends to be more or less congestion of the lungs, and a stagnation of the circulation in the lungs follows, so that pulmonary catarrh is easily established. In the treatment of rachitic infants with bron-

chitis, if the child is very fat we must get the excess of fatty tissue reduced. In such a case the diet must be extremely spare until the weight of the child has been reduced.

It is after the acute attack is over, and in cases of chronic bronchitis, that it is so important to recognize the underlying condition of rickets, because we can never cure such cases by ipecacuanha and squills and carbonate of ammonia, whereas if we put the child upon an antirachitic diet, including a full amount of fatty material, we will find that the bronchitis will be permanently cured.

Another affection to which these children are liable is bronchopneumonia. In the acute stage of that affection the child must be treated on ordinary lines. After the acute stage is over, if we find underlying rickets the patient should be put upon antirachitic treatment, and we will often find that the lungs will improve more markedly under that than under any drug treatment.

Next, with regard to the intestinal canal, the chief rachitic manifestation is diarrhea, which is especially common in summer. The immediate cause may be some overfeeding, or a chill, or teething. An attack of diarrhea comes on, and we must treat that upon general lines with simple diet. After the acuteness of the attack has passed off we must not keep on with astringents —bismuth and tannic acid and alum—but put the patient on cod-liver oil and the fatty diet, and we will find that we get better results by that treatment than by keeping the child on what one may describe as the ordinary treatment for diarrhea.

With regard to nervous affections, one of the leading characteristics of rickets is the tendency to nervous instability, which does not manifest itself by any persistent organic disease, but by a series of disturbances which are apt to be intermittent and prolonged. The chief ones are convulsions, laryngismus stridulus, and tetany. With regard to convulsions, that is a condition which one should always associate in infants with the rachitic condition—that is to say, if a child between the ages of nine months and two years has convulsions we must always bear in mind the possibility that rickets is the condition in the background. The immediate treatment of convulsions is the same, whatever the cause, namely, removal of the irritation by giving sedatives for the time being. But the point in connection with rickets is that we are not going to get permanent relief by the use of sedative treatment; the patient requires to employ antirachitic treatment.

Laryngismus stridulus is not only an accompaniment of rickets, it is a special affection of rickets. In other words, if a child has an attack of laryngismus we may be fairly certain that rickets is at the back of it. One very often finds that the spasm which is present will be relieved by giving the child plenty of fresh air. The condition is more apt to come on in hot, stuffy rooms than in a room into which the air is entering freely, and which is therefore fresh and cool. We give relief by castor oil to begin with, combined with bromide of ammonium. Locally we can employ counter-irritation by means of a sponge to the front of the neck, and put the child into a hot bath. Having reduced the acute stage by means of sedative treatment, we do not expect to get permanent relief except by antirachitic treatment. When an acute spasm comes on at night that is a condition not without danger, and it must be treated actively. But the spasm in some cases may be essentially chronic; it may come on only under excitement, or when the child is crying, and at other times there is no sign of it. In those cases, to go on giving bromide and that sort of thing does not lead to permanent cure. But if we give the child plenty of fatty food and plenty of fresh air we find it will readily pass off.

BUTTERMILK AS AN INFANT FOOD.

In the *Medical Record* of March 30, 1907, STRAUCH writes an exhaustive paper on this subject, which is of particular interest, because within a short time this method of feeding healthy infants, and especially those afflicted with gastrointestinal disturbances,

has found its way into numerous clinics and polyclinics of Germany. Authorities like Baginsky, Heubner, Caro, Soltmann, Escherich, Salge, and others have recorded very favorable results. Also in France, Roumania, Greece, and South America buttermilk has recently been tried as an infant food with equally encouraging results.

As the term buttermilk is employed to designate various dairy products, it is necessary to confine this term exclusively to churned milk, which may be made by the following methods: (1) Sweet cream, the product of centrifugation, or of milk that has simply stood for hours in a cool place, is churned, whereby the milk-fat globules, after the disruption of their haptogen membrane, form the butter. This buttermilk is almost identical with sweet, skimmed milk. (2) Since a slight acidity of the milk renders the churning more profitable, milk, or cream, is used which has soured by spontaneous fermentation, or after inoculation with sour milk, or with pure cultures of bacillus acidi lactici. The degree of acidity nearly corresponds to the neutralizing capacity of 5 to 7 Cc. of normal NaOH solution per 100 grammes of milk. This buttermilk differs from the aforementioned one by its acidity (due mostly to lactic acid), and by the fact that the casein is coagulated and suspended in the serum in very minute particles.

While the physical, chemical, and biological differences between cow's and human milk correspond to those between a calf's and an infant's stomach, sour buttermilk deviates still more from human milk. The former shows an acid reaction, the latter an amphoteric or slightly alkaline reaction to litmus paper. Human milk is abundant in fat, scanty in albumin, and coagulable by rennet. Buttermilk is scanty in fat, abundant in albumin, the casein is separated from the lime, and therefore coagulated, and incapable of further coagulation by rennet. In human milk the calcium salts are mostly suspended as insoluble phosphates; in sour buttermilk we find the calcium partly united with lactic acid; the insoluble di- and tri-calcium phosphates are converted into soluble mono-calcium phosphates. Human milk is almost sterile; buttermilk in its unboiled state abounds in bacteria, in saccharomyces species, and the products of their metabolism.

These great differences justified the skepticism and reserve in regard to the use of buttermilk in infant feeding until experiments and very favorable experiences removed every doubt as to its great usefulness in certain conditions. Buttermilk, in fact, has been proven to be one of the best dietetic remedies for gastrointestinal diseases of children, according to the medical literature of Germany. Sour buttermilk, however, is not to be administered in its raw primary state, but modified more or less in accordance to Teixeira's formula in the following manner: One liter (quart) of fresh buttermilk is mixed with one or two tablespoonfuls of rice—or wheat—flour, the milk being added gradually at the beginning, to prevent the formation of lumps. While being constantly stirred, it is heated slowly for fifteen to twenty minutes to the boiling point, and finally, after adding 50 to 70 grammes of sugar, it is cooled and hermetically bottled. The addition of sugar makes up for the lack of fat and the resulting deficiency in calories, and so does the flour, which besides prevents the formation of coarse, tough coagula during boiling. The formation of these coagula does not occur, however, if the buttermilk is boiled very slowly, so that the boiling point is not reached before thirty minutes. The caloric value of the buttermilk has by this process been increased from about 260 to 600 or 700 units per liter, thus approaching that of human milk. It contains a high number of caloridynamic units in a small quantity of fluid. The prepared buttermilk is a yellowish fluid, which after standing separates into two layers, the upper one consisting of the milk serum, the lower one containing the casein coagulated and suspended in very fine particles. By this fine division it resembles the fine coagula of human milk in the infant's stomach.

The excellent results obtained with buttermilk feeding in Germany induced a trial

of this method at the Caroline Children's Hospital in Vienna (Director, Dr. Knoepfelmacher), with a result which the author considers worthy of reporting on account of its very encouraging features (1903).

In preparing buttermilk, they followed Teixeira's prescription, and administered it in separate bottles of from 50 to 100 grammes. The daily quantity amounted in its calorimetric value to 80, 100, 120 units—*i.e.*, 120 to 200 grammes of milk per kilogramme of the infant's body weight. In acute cases of intestinal disturbance after a period of from one to two days under rice-water feeding, buttermilk was administered gradually in increasing quantities. After improvement had set in the quantity was increased, not only according to the actual weight, but also to the age of the child.

Their experience includes more than twenty cases, mostly of malnutrition, resulting from chronic gastrointestinal disturbances, with occasional acute exacerbations up to the intensity of cholera infantum; then some cases of *allaitement mixte,* one case of habitual vomiting (pylorospasmus), one prematurely-born child, and one case of icterus catarrhalis. Some of these cases had not responded to other methods of feeding and treatment.

The increase of weight during buttermilk feeding is accompanied by a general improvement. The babies become quiet and good-natured, they sleep well, and have a good appetite. Vomiting ceases, or becomes less frequent; the frequency of the stools lessens, although they may occur oftener than in normal breast-fed babies. The stools are usually yellow, homogeneous, pasty, and of a neutral or alkaline reaction. But even in cases in which the quality of the stools did not satisfy their expectation, and in which they had to dilute the prepared buttermilk with small quantities of rice-water, they observed a good increase of body weight. All the babies liked the buttermilk, even as an addition to breast feeding.

Their encouraging experiences being limited to a comparatively small number of cases, the author briefly reviews the results of others based on a larger experience, to show how excellent a remedy and food buttermilk has proved to be. The excellent experiences of Teixeira are so numerous that they have been the principal inducements for similar experiments in Germany. Teixeira's six years' experience covered many hundreds of cases which not infrequently manifested an increase in weight of from 500, 600, to 700 grammes. Baginski's observations range over 182 cases in the medical wards of the Emperor and Empress Frederick Hospital of Berlin. In 150 the results were excellent, in the remainder the improvement was less pronounced; in 32 children the feeding was unsuccessful. In the entire hospital he had fed 300 children with buttermilk with similar results. A few children were taken directly from the breast and given buttermilk because the mothers could not visit the hospital to nourish their children.

Salge reports 85 cases with very satisfactory results out of 119 babies who were fed with buttermilk for dyspepsia, chronic entero-catarrh, atrophia, and in *allaitement mixte.* In the remaining cases buttermilk failed, but so did also other methods, including human milk.

Jean Cardametic (Greece), Rensburg, Leschziner, and Escherich (Vienna) had similar experiences, and Dr. Riether, primarius of the foundling institution of Vienna, stated that atrophic babies throve excellently on buttermilk after other foods had been tried in vain. He found the remarkable fact that breast-fed babies who had been dystrophic without determinable cause showed a remarkable increase in weight and improvement if small quantities (one teaspoonful to one tablespoonful) of buttermilk were administered before each breast feeding. He supposes this to be due to the digestion-promoting action of lactic acid, which perhaps may also account for the good results obtained from buttermilk feeding in *allaitement mixte* of healthy babies.

Teixeira's original method of preparing buttermilk has often been modified to meet

special indications. For instance, the flour has been partly or entirely replaced by various dextrinized flours (Kindermehle) for babies in the first weeks of life, or for babies whose feces showed upon microscopical examination, or with the iodine test, starch in a greater amount, indicating insufficiency of starch digestion.

In extreme intolerance of carbohydrates the flour can be dispensed with entirely, and even the sugar may be replaced for a short time by some other sweetening substance (saccharin). The low percentage of fat in buttermilk has been increased with the best results (Rommel, Rensburg, Schlossmann, Huebner) by the admixture of cream or sesame oil, when buttermilk alone did not give satisfactory results, and an increased amount of fat was needed. For it is evident that fat cannot be replaced by carbohydrates, even isodynamically, for an indefinite period of time; since the principle of isodynamic substitution is not applicable arbitrarily or without limit; indeed, in some cases the poverty of fat in buttermilk may be a drawback.

Considering the almost paradoxical composition of an infant food of such approved and undoubted value in various intestinal disturbances which so often accompany artificial feeding, any attempts at explaining these results become very interesting. The unexpectedly good results obtained from this food, which is so rich in albumin, have been explained by the relative lack of fat; but experiments with simple skimmed milk (Knoepfelmacher) and the fact that the addition of cream aids the good results obtained in many cases do not support this supposition. The easy digestibility of the casein of buttermilk is almost universally admitted; it is probably due to the distribution of the former in extremely fine floccules as a result of the mechanical process of churning. In addition, the acid reaction, the abundance of carbohydrates, with their acid products of fermentation within the intestinal tract, may perhaps protect the albumin from more intense putrefaction and influence the reaction of the soil of the intestinal bacterial flora.

According to Rubinstein's investigation, pathogenic bacteria (of diphtheria, typhoid, tuberculosis, bacillus pyocyaneus) as a rule gradually perish spontaneously in buttermilk, both on account of the increasing acidity and the presence of the bacillus acidi lactici, or they are easily destroyed by boiling for only one, two, to three minutes. We further know that the acidity of the food promotes tryptic digestion, as the acidity of the stomach contents energetically stimulates (Pawlow) the secretion of trypsin. The digestibility of the nitrogenous substances of buttermilk lessens the work (Huebner) of the glands of the stomach and the intestines; the amount of energy thus spared is beneficial to the organism of the baby.

As to the indications for the use of buttermilk, no absolute rules can be formed, nor is any strict classification of the various intestinal disorders unanimously accepted. Buttermilk has been used with best results in insufficiency of fat—and of albumin—digestion; in *atrophia infantum* dependent on chronic entero-catarrh; in *dystrophia infantum* without determinable causes; in *allaitement mixte;* and in cases of sudden weaning. The high calorimetric value of the buttermilk renders it fit for feeding prematurely-born babies who are not able to nurse, or if no wet-nurse can be promptly secured. Many babies with intestinal diseases digest only buttermilk; others digest other foods as well. As a rule, acute intestinal disorders, and those chronic disturbances due to prolonged starch feeding, should be excluded. In case of intolerance for carbohydrates, buttermilk without flour, or even without sugar, may be tried for a short time.

The objections against a buttermilk régime are due to the fact that buttermilk of standard quality, which is indispensable for success, can be obtained only with great difficulty in large cities. The common commercial so-called buttermilk is indeed too often unfit for infant feeding on account of its contaminations, its unhygienic manipulation, and its unreliability with reference to acidity.

THE MEDICAL TREATMENT OF CONGENITAL PYLORIC STENOSIS.

In the *Lancet* of March 16, 1907, SUTHERLAND discusses the medical treatment of this affection. He does not refer to the surgical treatment, a subject which was very thoroughly considered at the Toronto meeting of the British Medical Association. His belief is that as our knowledge and experience of the medical treatment advance there will be fewer and fewer cases in which surgical intervention is called for.

1. *The Objects Aimed At.*—The aim of the medical treatment is to remove any source of irritation in the stomach which may maintain pyloric spasm, and to keep the stomach free from any irritating food material, digested or undigested, which may excite pyloric spasm. Within recent years many cases of this affection have been seen in the post-mortem room which presented hard, hypertrophied tissue and complete stenosis, and it was the common belief that only operative treatment could have relieved the condition. It must be remembered, however, that the pylorus has two functions, contraction and relaxation, and the fact that the muscular tissues generally are hypertrophied is no reason for assuming that only the power of contraction is retained. The author believes that both these functions are present at birth, and that there is in addition a congenital hyperplasia of the muscular tissues of the pylorus, as Cautley has so strongly insisted on. For a varying length of time, days or weeks in different cases, all goes well and the pylorus acts normally. But a time comes, even in the most carefully fed cases, when some irritating (undigested) food lies in the stomach, and the pylorus contracts strongly and remains closed. Vomiting follows. The repetition of such a condition gradually induces a more or less continuous spasm of the pylorus, or at least a spasmodic contraction which seriously interferes with the normal emptying of the stomach.

It may be that in some cases, as in those recorded by Willoughby Gardner and Still, it is possible solely by careful dieting and the use of a food leaving little residue in the stomach to check this overaction of the circular fibers of the pylorus. Such cases are probably rare, but they support the view that there is no inherent vice in the pylorus. They are rare because a diagnosis could seldom be made at a stage when such treatment would usually be effective. By the time a diagnosis can be made with certainty the spasm of the pylorus is established, and as the result hypertrophy and dilatation of the stomach have followed. We have then to deal with a fastidious, irritable, dog-in-the-manger pylorus, which must be humored and soothed and deferred to in every way. It is not to be supposed that even in marked cases the pylorus never relaxes. At operations it has frequently been found that the hypertrophied pylorus can and does relax, and will often admit the little finger without difficulty. In many cases the presence of fecal matter in the stools and the absence of vomiting for a week or more show that food is passing through the pylorus. The gravity of the affection lies in the fact that it does not do so in sufficient quantity for the nutrition of the infant. These would appear to be the grounds on which medical treatment may be expected to do good, and, expressed in other words, the aim of the treatment is to restore the function of relaxation of the pylorus which has been in abeyance owing to the more powerful action of the constrictor muscular fibers.

2. *The Food and Feeding.*—Although the stomach is much dilated and is capable of holding a large amount of food, small feeds are called for in order to secure complete digestion. Two or three ounces will be found sufficient at a meal, and in bad cases one-ounce feeds are advisable. In order to supply a sufficient amount of nourishment the number of meals must be increased. An infant aged one month should be fed every two hours day and night, and in bad cases, when only small quantities are allowed at a time, every hour by day. This may have to be carried on for some months unaltered, but if the progress of the case allows of it one will naturally try to increase the amount at a meal and feed less

often as time goes on. If the infant will sleep for longer intervals at night it should be allowed to do so, but hunger will usually awake it with great regularity. Small quantities, from one to four drachms, of plain water or dill water or cinnamon water may be given between the feeding times if the child is thirsty or wakeful. The difficulty in the complete digestion of the food in the stomach lies in the proteids and the fats, more especially the latter. Over and over again the author has found the addition of cream or cod-liver oil bring on gastric irritation and vomiting.

If good breast milk is available it is the best food. A chemical analysis of the milk should be made, and one would prefer to have rather a low amount of all the chief solids. The fat should not be more than 3 per cent. The quantity given at a time must be regulated by the duration of the feed, five or ten minutes as the case may be. Unfortunately, in many of these cases one finds that suckling has been stopped in the belief that the milk was disagreeing with the child, and one of the most useful adjuncts in the treatment is lost.

If artificial feeding is employed, cow's milk as usually modified does not act well owing to the heavy curds which remain in the stomach. The foods which have proved most successful in the author's experience are peptonized cow's milk (without added cream) and whey. In addition, malt extract, raw meat juice, and grape juice have been given daily in small quantities. No doubt other foods may be found equally efficacious, and the question of the suitability of the food is to be decided by the state of the stomach contents after washing out.

3. *Gastric Lavage.*—The stomach should be washed out once a day for a prolonged period, and in bad cases this proceeding may be required twice daily for a time. It is quite a simple process in young infants, and if properly carried out leads to no discomfort or disturbance. It should be done when under normal conditions the stomach is empty—*i.e.*, two or two and a half hours after a meal, as the case may be. The value of the information gained from the nature of the stomach contents cannot be overestimated. The washed-out material should show a small amount of soft flocculent matter, which tends to get less in successful cases as times goes on. If, on the other hand, a large amount of matter is washed out, or undigested curds, it is clear that the food is not properly digested and will maintain the pyloric spasm. Dr. Cautley has pointed out that in many cases the mere washing out of the stomach systematically will check the vomiting and that this may prove misleading. This is perfectly true, and therefore one must examine carefully the nature of the stomach contents in order to see whether the residue would be likely to pass the pylorus. If this residue is of the soft flocculent nature described above one may reasonably expect that it can, and will, prove non-irritating, and will eventually pass naturally through the pylorus. Other indications of improvement must also be looked for and will be referred to later. For the observation of these points and for the lavage to be of any real value it is of the first importance that the physician should carry out the proceeding himself and not entrust it to any nurse, however skilled and experienced she may be. Gastric lavage is not only beneficial to the infant, but is also the means of showing the physician how to regulate successfully the food and feeding.

4. *Signs of Progress.*—The vomiting ceases. This usually follows quickly after lavage and suitable feeding have been carried out. The bowels act naturally. This is a very important sign of progress, for it is in such marked contrast to what occurs in untreated cases. In the latter constipation is the rule, artificial aids per rectum being very often required, and the motions contain little fecal matter. After the medical treatment has been begun the bowels act two or three times a day without artificial stimulation, and the motions are larger and consist of fecal matter. The stomach peristalsis becomes less marked, less strong, and gradually passes off. The complete disappearance of peristalsis may take some weeks or months, but the lessen-

ing is usually seen early in successful cases. The discomfort, pain, apathy, and constant whining of the infant are removed and are replaced by a placid and comfortable state, in which even smiling is gradually evolved. The nutrition of the infant is improved. This is manifested in a healthy color, in increased activity of the limbs, and in a slow gain in weight. It is very important to remember that these infants cannot be fattened rapidly, that any attempt to secure this will probably end in disaster, and that the less weighing there is the better, especially if there are anxious relatives about. The most suitable foods are not fattening ones, and any excess of food is apt to produce disturbance either in the stomach or the bowel. On the other hand, the vital powers of the infant can be very much improved and the disordered functions restored to healthy action by a simple diet, and the fattening materials can be reserved to a later period. Progress in the infant is usually marked by a slow increase in weight, somewhat fluctuating at first, but tending to become steady as time goes on.

5. *Complications.*—A common complication in the course of treatment is diarrhea. The bowel in such cases has been out of use for some time and is consequently unprepared for the food material which now passes through the pylorus. Hence probably arises an irritative form of diarrhea. The best treatment is to reduce the amount of food given by one-half and to keep it so until the diarrhea has ceased. At the same time half a grain of gray powder may be given twice or thrice daily. When the diarrhea ceases the amount of food can be again gradually increased. Such diarrhea is always serious and may prove fatal. When vomiting occurs no food should be given for two hours in order to rest the stomach. Sips of hot water may be given if the child is thirsty. Intestinal flatulence is to be treated, like diarrhea, by a temporary reduction in the amount of food.

6. *Medicinal Treatment.*—The use of antispasmodic drugs such as opium and the bromides has not proved of the slightest value in the experience of the author. Of course, infinitesimal doses of opium cannot be expected to do any good, but the writer has pushed the drug to its full physiological effects without any benefit whatever. Nor does it appear likely that the drug would have any special action on the circular fibers of the pylorus and fail to affect the longitudinal fibers to an equal extent. In cases of marasmic infants suffering from this affection, with all the tissues dried up, the use of saline injections both subcutaneously and per rectum has seemed beneficial. From four to ten ounces of normal saline solution can be given daily and will act as a restorative until the improvement of the pyloric function allows of the entrance of a sufficient amount of fluid into the system by the natural route. In cases in which the infant is much reduced or has a subnormal temperature, brandy, up to half a drachm daily, will be found of service as a general tonic. The administration of cod-liver oil by inunction, if it be of any value, would appear to be especially suited to the conditions present in this affection. The author has employed it only once, and in that case a skin eruption quickly followed and led to its discontinuance.

UNILATERAL NEPHRITIS—NEPHRECTOMY.

The cases reported by ANGERER (*Archiv für klinische Chirurgie,* lxxxi, 2) were the result of traumatism of the loin.

The condition showed itself several weeks after the injury, no symptoms of renal injury appearing at the time. The affection was characterized by colicky pains in the kidney, with hematuria. The urine showed albumin and casts, and the general health was profoundly influenced. Operation was undertaken in one case on account of hemorrhage, in the other on account of the severity of the pains. In each case the kidney was removed and recovery was perfect, all signs of renal disease disappearing. The kidneys were large and congested, with localized hemorrhages in the cortex. The justification for operation is believed by the author

to be shown by the prompt recovery in each case. Nephrotomy would be dangerous on account of the tendency to postoperative hemorrhage.

RECTAL CARCINOMA—OPERATIVE TECHNIQUE.

The method described by ROTTER (*Archiv für klinische Chirurgie,* Band lxxxi, 2) differs from that usually employed in being a combination of the sacral and abdominal methods. The operation is begun by the sacral route, and if this is found insufficient the patient is turned over, the abdomen opened, the abdominal part of the operation concluded, the abdomen closed, and the rectal operation continued.

The method has the advantage over that of opening the abdomen, first, that in many cases, especially in women, the entire mass may be removed by the sacral route, and the patient spared the dangers of celiotomy. In those cases, however, in which the tumor cannot be reached from the anus, the abdominal portion is performed before the sacral. Of 25 cases operated on by the sacroabdominal method, in 16 (twelve men) the abdomen was opened first, in 9 (seven men) the abdomen was opened after the sacral route had been started. This was required by adhesions to abdominal organs in 6 cases, and by lymph glands which could not be reached in 3 cases. In women the high operation is very rarely required by the extent of bowel involved. As much as 26 inches of the gut can be removed from below. Firm adhesions must be separated very cautiously, on account of the great danger of rupturing the bowel, which means almost certain death from peritonitis.

The results obtained were good, considering that all cases would die shortly if not operated on. The operative mortality in cases over sixty years old was so high that Rotter does not consider operation on such persons advisable. It is better to merely establish a fecal fistula. Excluding cases over sixty, the mortality was only 33 per cent. Apparent cure has resulted in 11 cases. In 3 there was recurrence. As regards continence of feces, in 70 sacral resections 20 died, 16 had continence from the time of the operation, 16 were successfully operated on afterward to restore continence, 6 were treated unsuccessfully.

The difficulty of the pelvic operation is incident to the depth of the wound, and Rotter had a special knife 12 inches long made, in order to incise Douglas's sac and free the mesentery in the male pelvis. If the hemorrhoidal vessels are tied no other ligatures are needed. If the bowel stump seems to be sufficiently nourished, and can be brought down to the sphincter without difficulty, it is best to resect the rectum immediately above this, and to join the ends. If the mesentery of the retained bowel is partly sacrificed, or if the patient is in bad condition, it is better to make a false anus in the sacral region, and if desired attempt the union of the bowel and anal end of the rectum at a later time.

HOUR-GLASS STOMACH.

The diagnosis of hour-glass contracture of the stomach is neglected in almost all the text-books, and SCHMITT (*Archiv für klinische Chirurgie,* Band lxxxi, 2) gives its characteristic phenomena in detail. With the exception of the congenital form, which causes no symptoms, he believes that all forms, spastic, cancerous, and cicatricial, are dependent on ulceration of the stomach. If dilatation is present it may depend on a narrow stricture or on associated stricture of the pylorus.

The most striking symptom is usually vomiting. This may resemble the vomiting of pyloric obstruction if the stricture is near the pylorus, but differs in a tendency for only certain sorts of food to be vomited, although other food was ingested at the same time. The more easily digested foods pass through the stricture and are not vomited. Vomiting occurs

soon after eating if the stricture is near the cardia, and only a small part of the food ingested is vomited. If the stricture is central, as is usually the case, the vomiting occurs in two to three hours, and in several portions. There may be apparent vomiting after eating, but nothing come up if the cardiac portion is irritated and empty and the pyloric portion is dilated and too weak to empty itself through the stricture. In some cases the matter first vomited is recent, and later old and decomposed; this is also seen in some cases of extreme dilatation following pyloric obstruction. The pain is more severe than that of ulcer and less amenable to treatment. It is not so promptly relieved by vomiting, and returns sooner when food is taken or the patient rises after a treatment in bed. The pain which accompanies vomiting is especially violent.

Valuable information is given by the observation of lavage, but the chemical examination of the stomach contents is of little value. With the patient in the erect posture the stomach is repeatedly washed until the water returns clear; the patient then leans toward the right or backward, and there is often a sudden flow of fresh or old and decomposed food, which has come from the pyloric part of the organ. In other cases the lavage water fails to return. "It seems as though the stomach had a hole in it." The double form of the stomach may be shown by palpation and percussion of the organ dilated with gas or water, or may be shown by intragastric illumination with a gastric electric lamp. The most conclusive method is, however, the examination with the fluoroscope after ingestion of bismuth. Several hours must elapse between the ingestion and the illumination, as the bismuth may pass the stricture slowly. The treatment is not very satisfactory. It is rarely possible to unite the two portions of the stomach more freely, and the most effective treatment at present seems to be gastroenterostomy. Even if a plastic operation on the stomach is performed, a gastrointestinal fistula should be added.

OPERATIONS ON THE CEREBELLUM.

The results of these operations have improved so rapidly in recent years that BORCHARDT (*Archiv für klinische Chirurgie,* Band lxxxi, 2) has reviewed the entire subject in the light of present statistics.

Very extensive exposure of the base of the brain can be made safely. Both sides of the cerebellum may be exposed at once by forming on each side a quadrangular flap of scalp and skull, extending from the mastoid process to a point above and inside the occipital protuberance. These flaps being turned down and all bleeding stopped, the central part, not including the longitudinal sinus, is cut through at its upper and lower ends and also turned down. The bone is thick and must be partly sawed before cutting or breaking. The danger from breaking into the foramen magnum has been exaggerated. The brain is well protected here by very thick membranes. The ligation of the transverse, sigmoid, and occipital sinuses is in itself harmless. The longitudinal sinus and the tentorium must be spared. If the tentorium is injured, prolapse is almost certain to follow. The cerebellum being exposed is palpated, punctured, or incised as required, and also pushed aside with spatula, to facilitate examination of the base of the skull. If the shock is very great after opening the skull it is best to wait, and to examine the brain and complete the operation later. If after the operation is concluded it is found impossible to return the cerebellum inside the dura, it is better to reduce its size by partial resection than to leave part of it outside the dura. Puncture of the ventricles is apt to lead to sudden death. The dura is loosely closed to allow escape of secretions. Prolapse after operation is not always a sign of infection, but is almost always fatal. Operation is indicated when there are signs of pressure at the base of the brain, and when the diagnosis is not certain. The first indication of choked disk is the sign for immediate operation.

The various conditions which demand

operation are the following: (1) Cholesteatoma. The results have been favorable when the tumor was small enough to be removed *in toto*. A layer of sound tissue must be removed on all sides, as cholesteatomata resemble the malignant tumors in their tendency to recurrence. (2) True tumors, neuroma and sarcoma. The results here are also good. Of 101 cases reported, the tumor was found in 51, and of these 12 were cured. No tumor could be found in 60, but 5 of these were entirely relieved by the operation; 12 other cases showed temporary improvement. (3) Cysts. Here again the results are very good. As many of the cysts arise from softened sarcomata it is not wise to merely tap them. The entire wall should be examined, and if necessary resected. In 14 cases 13 were cured. (4) Neuroma of the cranial nerve roots. Tumors are found on the roots of the fifth, sixth, seventh, eighth, and ninth nerves, especially the eighth. Operation is always justified, as the localization is quite certain and the tumors are rapidly fatal if let alone. They are generally well encapsulated. Removal should not be attempted if the tumor is very large or not well defined. Is it justifiable to remove part of the cerebellum in order to expose such a tumor? Experiment has shown that the removal of more than half of one lobe is not well borne, so no more than this should be resected. (5) Decompression. This is performed for large tumors and for some cases of chronic meningitis. The results are generally good, but temporary. The indications are not yet entirely precise.

PENETRATING WOUNDS OF THE ABDOMEN.

WREDIN (*The Military Surgeon*, vol. xx, No. 3), chief surgeon of the Russian army in Manchuria, notes in regard to the treatment of penetrating wounds of the abdomen that the completer the rest afforded to the wounded from the moment the wound is inflicted, the better the prediction. As to the wounds of small caliber rifles, death as the immediate result is observed only when large blood-vessels are involved. In all other cases the earliest symptom following the infliction of the wound is shock, the intensity of which is in inverse proportion to the distance from which the shot has been fired. Most of the wounded fall immediately with a sensation of a hard blow on the abdomen. They do not lose consciousness. There is usually little pain in the first hours following the wound, but a sense of great weakness, attended by a fall of pulse, and vomiting. These cases usually die in the first twenty-four hours. The treatment on the battle-field is absolute rest and liberal injections of morphine. These remarks apply to those who have had abdominal wounds from small caliber rifle bullets at a distance up to 200 yards. With the increase in distance the character of wound becomes more and more favorable, and beginning from the distance of 400 yards the explosive effect of the bullet is hardly perceptible. Thereafter the first symptoms of shock become slighter, the man struck does not always immediately fall, but is often able to walk a certain distance, though shortly vertigo, paleness, and weakness set in, obliging the man to lie down. There is also often vomiting, especially in those who drink much water. These cases apparently offer excellent chances for laparotomies, but as a matter of fact the expectant treatment gives a much larger percentage of recoveries. A small caliber bullet often leaves openings so small in the hollow viscera that muscular action alone is sufficient to close them. Nor is prolapse of the mucous membrane observed. As to the effect of motion incident to transportation, Wredin notes the number of cases of death was least among those who had entered the train on the day of its arrival and was greatest among those who had entered the train on the day of its departure; thus showing that even transportation by rail in the soft-springed Pullman cars exerted a distinctly deleterious effect. He notes

that if all those wounded in the abdomen had been placed in a proper condition of complete rest for at least the first week after the infliction of the wound, the issue undoubtedly would have been still more favorable.

As to medicinal treatment, morphine is advocated by Wredin mainly because of its antagonistic effect upon shock.

Gunshot wounds of the abdominal cavity inflicted by rifle bullets give an approximately general mortality of forty per cent. The mortality from wounds inflicted with shrapnel bullets is nearly twice as great. This is explained by the fact that the diameter of the shrapnel bullet is about three times as large as the diameter of the rifle bullet, and its initial velocity is about six times less; also the shrapnel bullet has no hard coat, and from the very moment the shell bursts is easily subject to different deformations. Hence Wredin holds that active surgical interference is indicated in all cases of shrapnel wounds of the abdominal cavity, not only for the purpose of stopping intra-abdominal hemorrhage, but also to isolate the injured region by tamponing, as this cannot be done by nature. The suturing of the injured margins of wounds of the stomach, the intestines, or the bladder is a dangerous and purposeless waste of time. Active operative intervention is also indicated in all cases when the abdominal cavity is wounded by deflected bullets or fragments of shells, provided the general condition of the wounded and the surrounding circumstances are favorable. A deflected bullet loses a great part of its initial velocity and usually has become deformed, hence produces a greater destruction of tissue. Such wounds are often observed with artillerists, because when gun-fire is directed against a battery a great number of bullets are deflected from the cannons and their stands. Shock in such cases is for evident reasons distinctly expressed, and a great number of these wounded perish early.

The stab and cut wounds of the abdominal cavity inflicted during the Japanese-Russian war were with the bayonet and the Cossack's pike, the wounds of the latter class all without exception soon ending in death, this depending upon the size of the arm as well as the immense force with which the wound was inflicted; not only the head but also the thick shaft of the pike usually piercing the abdominal cavity. The Japanese bayonet is a long, solid, pointed knife, whereas the Russian bayonet has the shape of a four-faceted conic awl. The Japanese bayonet therefore makes more or less longer open cut wounds of the abdomen, with grave injuries and even prolapse of the intestines, usually resulting in rapid death from traumatic shock, hemorrhage, or acute septic peritonitis. Surgical interference is indicated when the condition of the patient warrants it for the purpose of stopping the hemorrhage, which in these cases is always profuse, and suturing the injured organs, with following tamponade of the abdominal cavity. In the front field hospitals, prolapsed intestines should in no wise be reduced, the aseptic conditions being very imperfect. Here nothing but aseptic dressing, with a considerable quantity of cotton-wool as protection against cold, should be applied. After injection of morphine the wounded should be transported at the earliest convenience, for a radical operative intervention, to the field ambulance or the nearest hospital.

The Russian bayonet inflicts a punctured wound the margins of which close quickly after the bayonet is extracted, and the mobile loops of intestines and big blood-vessels often escape the rather blunt and narrow end of the weapon.

The treatment of these cases should always consist in operative interference if the general state of the wounded admits it, the surgeon following the course of the wound and closing the perforation by suture; tampons should then be inserted into the abdominal cavity.

As a result of his personal observations Colonel Wredin believes that active operative interference, when admitted by the

general condition of the wounded and the surrounding circumstances, is indicated in all cases of perforating wounds of the abdominal cavity, with the exception of wounds inflicted with the modern small caliber undeformed rifle bullets.

All cases of abdominal wounds require absolute rest for at least the first week after the infliction of the wound, and morphine is the remedy *par excellence*.

TREATMENT OF HEMORRHOIDS UNDER LOCAL ANESTHESIA WITH STERILE WATER.

GILMAN (*Boston Medical and Surgical Journal*, April 11, 1907) says that nearly all uncomplicated cases of hemorrhoids can be radically operated upon in the office or at the patient's home under local anesthesia with very little pain or discomfort, and with but slight, if any, interruption in the daily habits and engagements of the patient. The degree of anesthesia produced by cocaine and similar products is very satisfactory, but their use is frequently followed by toxic effects.

During the past eighteen months the author has operated upon 23 cases of hemorrhoids under sterile-water anesthesia, and upon 16 cases with the combined use of one-half of one-per-cent eucaine in two-per-cent boric acid solution and sterile water. The technique of the ligature operation for the radical cure of hemorrhoids under the combined use of eucaine solution and sterile water is as follows:

The patient is given an enema of one pint of warm water to clean out the rectum; then a small enema—four to six ounces—of equal parts of warm water and glycerin is thrown into the rectum, the passage of which causes straining and a resulting engorgement of the hemorrhoidal tumors. The external parts are scrubbed and made as aseptic as possible; then the eucaine solution is used to anesthetize the sphincter muscle. A sufficiently long anesthetization needle should be used, and one point of entrance selected in the median line at 1 to 1¼ inches from the posterior anal margin. With one finger in the anal canal as a guide, the needle can be directed along either side of the anal wall, thus anesthetizing the muscle thoroughly. The sphincter should be carefully divulsed, when the engorged hemorrhoids are brought into view. These are now anesthetized with warm sterile water; the needle point is thrust into the center of the tumor and the water is slowly forced into the tissues in sufficient quantity to distend them until they are of a glassy-white appearance, when anesthesia is complete. The pressure exerted upon the terminal nerve filaments is sufficient to prevent cutting pain, although some patients complain of discomfort for a moment, due to distention, which is entirely relieved as soon as the tissues are cut. The tumor can now be grasped with a hemostat and pulled down. A U-shaped incision is made at the mucocutaneous junction, and a stout linen or silk ligature is placed around the entire tumor and is securely tied. The part outside the ligature is excised, care being taken to leave a stump of sufficient size to prevent slipping of the ligature, or, when the tumor is very small, it can be left to slough. This method should be followed until all of the hemorrhoids have been ligated. Then a thick, wedge-shaped pad of gauze should be applied firmly to the anorectal region under a T-bandage. Laxatives should be given to produce a semisolid stool each day. The anal canal should be cleansed thoroughly, and an application of 10-per-cent solution of ichthyol in glycerin, balsam of Peru 50 per cent, or 2- to 4-per-cent solution of nitrate of silver made daily until sloughing is completed and the resulting ulceration healed.

The points in favor of local anesthesia in the operative treatment of hemorrhoids are many. It is safe and effective; it can be easily and quickly applied; it simplifies the work and takes away the fear which most people have of taking a general anesthetic. Pain at the time of the operation is rare. Postoperative pain is less than

under the old methods, and is very slight when sterile water is the agent used. The period of detention from business is greatly reduced, and often patients can go about their usual occupations, as confinement to bed is not an absolute necessity. It affords relief in some cases otherwise unsuitable for an operation, and takes many cases from the hands of the quack and itinerant. It enables the operator to secure permanent results, and, if properly applied, admits of as thorough and complete work as can be done under a general anesthetic.

THE OPERATIVE TREATMENT OF HEMORRHOIDS UNDER LOCAL ANESTHESIA.

HILL (*Boston Medical and Surgical Journal,* April 11, 1907) believes that the various standard operations for hemorrhoids are all eminently satisfactory so far as the radical cure is concerned, but that the objection to them is that they require ether or chloroform narcosis. It has been abundantly demonstrated during the last few years that nearly all cases of hemorrhoids can be relieved just as radically and safely by means of infiltration anesthesia. The ligature operation is the choice of all operations when local anesthetics are employed. The success of the operation depends upon the manual dexterity of the operator and careful attention to the details of producing the anesthesia. A careful preliminary examination is important to accurately determine the situation and size of the hemorrhoids which require removal, as well as to ascertain whether any other condition, such as fissures or ulcers, coexists. On the day before operation the bowels should be moved by a laxative. In case immediate operation is desirable the rectum can be cleared out by giving an 8-ounce enema of boric acid solution.

The patient is placed in the right semiprone position, since the greater number of hemorrhoids are usually to be found on the right side. If the external sphincter muscle is hypertrophied and spasmodic so that the hemorrhoids cannot be readily prolapsed, the sphincter muscle can be dilated with comparatively no pain by the injection of a few drops of cocaine solution into it at the point of entrance of the lesser sphincter nerves. The needle is inserted in the posterior commissure three-fourths of an inch from the anus, from which single puncture the nerve supply of the anal region may be effectually blocked. The divulsion of the sphincter is now carried out in the same manner as though the patient were etherized. The hemorrhoids being prolapsed are operated upon in rotation, beginning with the anterior one on the right side. Each tumor is in turn moderately distended with a one-tenth of one-per-cent solution of cocaine; then, seized with a pair of pile forceps and gently elevated, the hemorrhoid is dissected upward until it is attached by a narrow pedicle which contains its blood supply. A ligature is now passed about the pedicle as high up as possible and the hemorrhoid is cut off below the ligature. After the internal hemorrhoids have all been ligated, any folds of anal skin that are clearly redundant should be removed. If the base of these folds is quite broad it is best to unite the edges of the wound made in removing them by a catgut suture.

The after-treatment of these cases requires careful attention. The bowels, as a rule, should act on the second day, and daily thereafter. The anal region should be kept scrupulously clean and protected by wearing a pad of sterilized gauze. After the ligatures have separated, applications of 15-per-cent balsam of Peru in castor oil, or ichthyol and glycerin, 15 per cent, should be made to the anal region to secure rapid healing of any lesions which may remain. Should there be much soreness or pain when at stool or otherwise, this can usually be relieved by the injection of an ounce of sterilized olive oil at night. The operation should be performed in a hospital, except in mild cases where only one or two piles are to be removed.

After operation absolute confinement in

bed is unnecessary, patients doing better if somewhat on their feet, but they will not be able to attend to their usual avocations in less than three or four days to a week.

PROPHYLAXIS IN SYPHILIS.

MAISONNEUVE (Paris, 1906) reports his experiments with 10-per-cent calomel ointment as a prophylactic in syphilis recommended by Metchnikoff. Metchnikoff's original experiments were with mercurial ointment, but he found this was too irritating to the skin to be used as a general measure. Maisonneuve, after submitting himself to a careful personal examination, in order to definitely preclude any evidences of syphilis, allowed himself to be inoculated, in the sulcus coronarius on each side, from the virus of two initial lesions from two well-defined cases of primary syphilis. This in the presence of Metchnikoff and four other physicians. The skin was scarified and the virus thoroughly rubbed into the abraded surface. One hour after the inoculation the parts were treated with 10-per-cent calomel-lanolin ointment. Apes which were inoculated with the same secretion showed typical lesions of syphilis; others, likewise inoculated, but also treated with calomel ointment, remained free from syphilis. Maisonneuve submitted himself to careful examinations for three months, without showing the slightest evidence of syphilis, and the wounds promptly healed within seven days.—*Southern Medicine and Surgery,* February, 1907.

EMPYEMA AND ABSCESS OF THE LUNG AS SEQUELS OF ACUTE SUPPURATIVE APPENDICITIS.

GAGE (*Boston Medical and Surgical Journal,* April 11, 1907) discusses those complications and sequelæ of appendicitis in which the pleura and lung are involved. The most common method of extension from the original focus of suppuration in the appendiceal region to the thorax is either intraperitoneally or extraperitoneally behind the kidney, first to the subphrenic space, thence through the diaphragm to the adjacent pleura, and finally to the contiguous portion of the lung with probable communication with the bronchus. In this way the abscess is frequently evacuated through the mouth. More rare methods by which these sequelæ may occur are either by localization of a general systemic infection or by the appearance in the pleura or lung of one or more abscesses which arise in the course of a secondary pyemia. These sequels of appendicitis occur in not less than two or three per cent of all suppurative cases.

The author refers to a case of his in which the patient was operated upon for empyema, and because of the dark color and fecal odor of the pus evacuated, suspicions were aroused as to the source of the suppuration. It was found on inquiry that the patient had a definite history of acute appendicitis three weeks before.

The right side is usually the one involved, although the left side may be invaded.

The mortality of these cases is about one in six. Even without operation, if evacuation of the abscess takes place through the bronchus, the prognosis is favorable. The author reports one case of his own in which recovery after a most critical illness occurred after evacuation of the abscess through the mouth.

As regards treatment, much may be done in the way of prevention by more efficient drainage of those appendiceal abscesses which extend back into the flank. This may be accomplished by leaving a large opening in the abdominal wall, high enough up to be directly over the upper part of the abscess, or by making a counter-opening in the loin. When a subphrenic abscess or pleural empyema is suspected and confirmed by physical signs, the two inches of the ninth and tenth ribs between the scapula and the anterior axillary line should be removed. If pus is present in the pleural cavity this cavity should be opened and drained. If the pus is below the diaphragm the upper part of the wound should be walled off with gauze and the abscess

opened and drained, avoiding if possible any contamination of the pleura.

The author believes that cases of pleural infection sometimes go unrecognized.

THE TRYPSIN TREATMENT OF CANCER.

LUTHER (*New York Medical Journal*, Feb. 23, 1907) presents a full discussion of the trypsin treatment of cancer, based upon knowledge gained by a visit to Beard and other workers in Great Britain, as well as upon some observations of his own. Beard's introduction of trypsin as a therapeutic agent in cancer is based upon embryological discoveries which he has made in the course of his studies of this subject. Instead of developing directly from an egg, the course of development of the embryo is extremely indirect. The fertilized egg undergoes karyokinetic division and subdivision to a limited number of mitoses depending upon the species. The result of this is a tissue named variously by Beard as phorozoön, trophoblast, larva, or a sexual generation. This tissue, which composes in reality, partly or wholly, the chorion, is endowed with "indefinite, unrestricted powers of growth." Digestion in these cells is an intracellular, acid, peptic one, as has been proved by Hartog.

The final division of these trophoblastic cells results in a primitive germ cell which again divides and subdivides to a various but definite number of mitoses depending upon the species under observation. The actual number for man is not known. This division results in a number of primary germ cells, again the number depending upon the number of divisions, this being definitely fixed for every species. For instance, in the skate the primitive germ cell undergoes seven mitoses resulting in 512 primary germ cells. From one of these primary germ cells the embryo develops. The remaining germ cells form the foundation for the succeeding generation—that is, they develop into the sexual glands of the growing embryo. Beard has observed these cells in various stages of migration into the embryo. In the earliest stages of the skate, while there are still three distinct layers, no germ cells are seen while the outlying blastoderm is crowded. As time advances they are found betwen the layers, and later still large numbers are seen there. The objective point of these migrating cells is the germinal nidus, and after arriving there they begin to undergo division, and finally, after a limited number of mitoses, develop into primitive ova if the organ is an ovary, or spermatogenic cells if a testicle.

After the embryo is well formed and the organs mapped out and functionating, the trophoblast is no longer of use and disappears. The cause of this disappearance is purely hypothetical, but Beard believes that it is due to the activity of the pancreatic secretion. Up to this time the cell divison has been an intracellular, acid, peptic one, and from this time, which Beard calls "the critical period," the digestion becomes an alkaline, pancreatic one, and as a consequence these cells are digested and absorbed.

This normal course is subject to variations. During the act of migration many of the primary germ cells never reach their objective point—the germinal nidus—but, wandering between the layers of the forming somatic cells, are obstructed in various corners and crevices and forever lost. The usual fate of these vagrant germ cells is degeneration and absorption, but they may become encapsulated and remain. Should any of these encapsulated vagrant cells attempt to go through its life cycle, the result might be a monstrosity such as the Siamese twins; one embryo attached to another; or one embryo, partly or wholly developed, more or less completely embedded in another well-formed one. So we may go down through the scale to the class of tumors known as embryomas, teratomas, or dermoid cysts, which in the ovary would be the result of persistent germ cells.

In the development of a malignant tumor, either the embryonal stage is skipped by these developing vagrant cells, and in proliferating a trophoblast is formed, or the cell attempts to go through with its normal cycle—the production of an ovum which in

its turn develops into a trophoblast; the embryo failing, there is no "critical period" and no check put upon the "indefinite, unrestricted power of growth" with which these cells are endowed. This is an "irresponsible trophoblast," or malignant tumor.

Beard, having noticed the trophoblast gradually disappear with the development of the pancreas, decided that the pancreatic ferments caused this disappearance. If this were true, he reasoned that the pancreatic ferments would cause the disappearance of an irresponsible trophoblast or malignant tumor. This theory was confirmed by experimental work. The pancreatic ferment acts upon the cancer albumin and the cancer ferment in an antagonistic manner, as a result of which the tumor gradually diminishes in size and disappears by absorption, or is killed and converted into a benign fibrous mass.

Shaw-Mackenzie had introduced the use of trypsin in the treatment of cancer at about the same time, but was led to its use in an entirely different way.

The treatment consists in the hypodermic injection of a solution of trypsin daily for a period of four weeks, followed by the hypodermic injection of a solution of the diastatic ferment, amylopsin, every other day alternating with the injection of trypsin, the maximum dose of which is maintained. This for four weeks, followed by another period of four weeks or more, during which daily injections of amylopsin alone are given.

The trypsin injection which the author has used is a sterilized glycerin extract of the freshly macerated pancreatic gland, and besides trypsin it contains all the other pancreatic ferments. The amylopsin injection is, he believes, freed from the other ferments. They are both in 60-per-cent glycerin solution and consequently require dilution with two volumes of water or normal salt solution. They are put up in sterile glass ampoules, containing about 20 minims each.

The treatment should be started with a few preliminary injections of 5 or 10 minims before the full dose of one ampoule is given. After this the dose may be gradually increased. Maguire, of London, gives two ampoules, or 40 minims, as the maximum dose, but 75 minims is frequently given without bad effects. The dose of amylopsin should be graduated in the same way.

The injections may be given anywhere except into the tumor, on account of the pain and local inflammation produced. Probably the best place is the loose cellular tissue of the loin. It should be thrown deep into the cellular tissue, but not into muscle. The greatest care should be exercised to render the syringe and the skin at the seat of the injection sterile. Abscesses are apt to follow failure in this respect. Though the author has given over five hundred injections, not one has caused any more trouble than some soreness and induration, which lasts for a few days.

Trypsin is rendered inert by heat, consequently care must be taken to cool the syringe after boiling before the solution is drawn into the barrel.

In addition to the hypodermic injection, stress is laid upon the oral administration of some pancreatic preparation. The local application, where possible, of a liquid or powdered preparation of trypsin or pancreatin is also recommended where the cancer can be reached. This undoubtedly is useful, for it does cause a rapid breakdown of the mass.

Some patients after receiving a number of injections show toxic symptoms, which Beard attributes to the digestion and absorption of the cancer cells. These symptoms, beginning with nausea and vomiting, pain in the back and drowsiness, develop, but usually clear up promptly under injections of amylopsin, while the trypsin treatment is continued but the dose diminished. Should the trypsin be continued without amylopsin in these cases, high arterial tension, albuminuria, rigors followed by rise of temperature, and coma might develop.

The trypsin treatment has been used by various observers in different parts of the world, and of the reported patients five have been pronounced cured, though in not one of them has the microscope corroborated

the clinical diagnosis. It is the consensus of opinion of those who have tried the treatment that it does in most cases cause an arrest or shrinkage of the growth; improvement in the general nutrition, in which the appetite improves and the weight is maintained or increased; diminution or cessation of pain, and diminution in the discharge and fetor except in those cases in which sloughing occurs. Large doses are required, and perfection of the treatment will necessitate the finding of methods for obtaining pure and more concentrated solutions of the ferments so that they can be administered in reasonable quantities.

CYSTOPEXY FOR FALLING OF THE BLADDER.

LAPTHORN SMITH (*Montreal Medical Journal*, April, 1907) says that among the many causes of cystitis is cystocele, which usually accompanies falling of the uterus, but may occur alone. The cystocele is due to difficult labor, in which the head pushes the bladder before it, or to the too early use of the forceps. By these means the bladder is torn away from its attachments to the back of the pubis and to the anterior abdominal wall. When the cystocele has become marked there is dysuria, complete evacuation of the bladder is impossible, and the retained urine decomposes and produces an irritable condition about the neck of the bladder. By the straining which is thus caused the condition is made worse.

A little more than three years ago the author proposed the operation of cystopexy, or fastening of the bladder to the abdominal wall, as a remedy for those cases of cystocele accompanied by falling of the uterus which cause enough discomfort to justify the risk of opening the abdomen. He reported a successful case in the spring of 1904. The operation is very easy to perform. After the abdomen has been opened rather near the symphysis pubis, the bladder will be seen low down in the pelvis, and must be gently grasped with a bullet forceps and drawn up as high as it will go without employing force. Both the peritoneal surfaces on the bladder and on the anterior abdominal wall are scarified or criss-crossed with a needle until there is slight oozing. A curved needle is then passed through the abdominal wall, including all layers except skin and fat, then under the peritoneal and muscular layers of the bladder and out through the peritoneal and muscular layers of the abdominal wall on the other side, bringing after it a chromicized catgut thread, strong enough to last a month. Two or three similar stitches are passed at intervals of half an inch, after which they are firmly but gently tied. This is generally followed by fixation of the uterus about an inch higher upon the abdominal wall. Care must be taken not to allow the needle to go through the vesical mucous membrane, although there is very little danger of doing this as the needle can be kept in view all the time as it passes under the transparent peritoneum and muscular layer of the bladder. The larger the area of scarification on the bladder and abdomen the stronger will be the adhesion and the more certain will be the result. No precautions are necessary with regard to emptying the bladder; as a rule the patient can do this without the help of a catheter from the very first.

Smith reports a second successful case in the article which is here abstracted. He expresses the hope that the operation will be tried by some of the more prominent surgeons, and that, if it be found as valuable as he believes, it may be adopted as a standard method of treating these cases of bladder trouble.

MECHANICAL TREATMENT OF NON-TUBERCULOUS JOINT INFECTIONS.

TAYLOR (*New York State Journal of Medicine*, April, 1907) says that the chief things we have to do in joint infections are to improve general and local nutrition, prevent injury, and prevent or correct deformity. Motion of a joint or its use in bearing weight is injurious in the active stages of joint infections. Proper and timely control of joint function will usually relieve pain, allay joint irritation, prevent deformity, and favor recovery. The pain during onset and

in the early stages of some infections is often severe, and prompt relief is uniformly afforded by fixation and traction. Plaster splints are convenient for fixation. In applying them the padding should be moderate in amount and the bandaging should be even and firm. For strict immobilization the splint should include not only the joint infected but those nearest to it. To fully immobilize the hip, the trunk, pelvis and affected limb to the toes should be included. In acute rheumatism there are few measures that give the patient more relief than splinting.

When active suppuration is present prompt surgical interference is indicated, and this should be followed by mechanical treatment. In case the joint infection is due to a general infective process, the treatment of this general infection should be attended to. Infections of the spine, which are often painful and seriously disabling, are frequently relieved and ultimately cured by a fixation jacket, corset, or brace; recumbency in bed alone is not sufficient. In chronic joint infection constant exposure to fresh air and sunshine and attention to diet and general hygiene are very important. During convalescence local nutrition and natural drainage may be aided by vibration and motion of the joint, and if all irritation has subsided, by use of the joint properly controlled and regulated by mechanical appliances.

Splinting should not be rejected because of the fear of atrophy and stiffness. The atrophy is due to the inflammation and consequent disuse of the joint, and will occur whether splinting is done or not. After the joint inflammation has subsided the tissues will be restored unless the joint remains stiff. The stiffness is due not to splinting but to adhesive inflammation, which is likely to be increased by rough movements and neglect of splinting. The more one fears ankylosis the more strictly should the infected joint be splinted to prevent injury and deformity and allay irritation, and the more cautious should one be regarding forced movements. The way to cause certain ankylosis of a tender but somewhat movable joint is to use forcible movements of wide extent at frequent intervals. Passive and even forced movements have a place in breaking up adhesions and increasing motion in cured cases, but their use calls for ripe judgment and conscientious reserve.

INTESTINAL PERFORATION IN TYPHOID FEVER.

BLAKE (*New York Medical Journal*, February 23, 1907) says that approximately one-third of the deaths in typhoid fever are due to intestinal perforation. In 618 cases occurring at the Roosevelt Hospital the percentage of deaths due to perforation was 48.5. The percentage would undoubtedly be increased if autopsies were held in all cases of death, for in many cases in which autopsies are held perforations are found when none have been suspected. The estimated number of deaths in the United States every year from perforation in typhoid fever is about 10,000; whereas the number of cases operated upon is very small, only 225 cases having been reported as operated upon up to 1904. At the most liberal estimate, only two per cent of the cases of intestinal perforation come to operation.

The author has found that in cases which he had not seen before perforation the diagnosis was extremely difficult. The symptoms which the author has found in his experience to be most reliable are given. The first thing that happens when perforation occurs is leakage of intestinal contents into the peritoneum; this produces irritation before it can be said to have caused a true inflammation, and it is upon the symptoms of irritation that our diagnosis should be based. These are, first, pain which usually comes on suddenly and is often severe; secondly, tenderness; and thirdly, the most important of all, muscular rigidity. If, when a patient complains of pain, we examine the abdomen and find that it is tender over the usual site of perforation, namely, the lower right quadrant, and that in addition there is some rigidity of the abdominal muscles, the diagnosis is sure enough

to warrant operation. This symptomatic syndrome is present in a great majority of cases, although one or more of the symptoms may be absent; but usually, when so, some of the subsidiary aids to diagnosis are present. These are, chiefly, a sudden change for the worse in the patient's condition; he may sweat or shiver, his pulse may rise slightly or his temperature fall, free gas may be present in the abdomen as evidenced by diminished liver dulness, and lastly, there may be leucocytosis. Of course the presence of free gas in the abdominal cavity is conclusive, but as it is present only in less than one-third of the cases, its absence means nothing. Leucocytosis usually develops with peritonitis, but it may be absent even when the peritonitis is far advanced in patients with little reactive power; furthermore, it may be present without perforation.

About 25 per cent of the cases operated upon are saved by the operation. In many parts of the country it is impossible for the physician, even if he makes a diagnosis of perforation, to get a surgeon in time to help the patient. However, the number of surgeons who are competent to operate in such cases is increasing every year, and there are many who can be called and reach the patient in due time. It is well recognized that in all perforative conditions in the abdomen early operation gives the best results. Shock is no contraindication. Shock is due to the irritation of the peritoneum produced by the escape of the intestinal contents, and the susceptibility to irritation disappears upon the administration of an anesthetic. The administration of ether has repeatedly been observed to remove shock in these patients, the pulse at once improving and the color returning to the face.

The operative technique employed by the author at the Roosevelt Hospital in cases of typhoid perforation is as follows: General anesthesia with ether is used, with preference for the drop method. General anesthesia is better than local for these reasons: in the first place it robs the operation of its terrors to the patient, thus diminishing shock; and secondly, most important of all, it produces complete relaxation of the abdominal muscles, thus permitting a more rapid and complete exposure of the intestines. While the perforation is being repaired the anesthetic can be administered, and it can be practically stopped while the wound is being closed, particularly if some morphine has been given before the operation. Again, it is impossible to wash out the abdomen thoroughly under local anesthesia.

The incision is best made directly through the outer third of the rectus muscle, the direction of the incision conforming to that of its fibers. As soon as the abdomen is opened, the finger is introduced and the ileum is picked up close to the ileocolic junction. This, as a rule, can be done by feeling alone by simply hooking the finger from below up in this direction. The first three feet of the ileum are rapidly looked over, and if perforation is not found the cecum and appendix are inspected. In all Blake's cases the perforation has been in the ileum. He usually closes perforations up to five millimeters in diameter with three continuous Lembert stitches, the middle stitch being over the center of the perforation. As soon as the stitches are introduced the ends of the sutures are tied together, thus inverting the aperture. Larger perforations are closed according to the indications, care being taken not to narrow the lumen of the gut to a diameter less than half an inch. Resection should not be done if it can possibly be avoided. As soon as the perforation is closed the intestine is dropped back in the abdomen, a two-way irrigator is introduced, and the abdomen flushed out with saline solution.

In cases in which there is an abscess cavity or much necrotic fibrin left, a cigarette drain is introduced to the bottom of the pelvic cavity. When there is no gross necrotic material left deep drainage is not used, a cigarette drain being introduced simply through the abdominal wall into the peritoneal cavity.

The after-treatment is important. The head of the bed is only slightly elevated,

as these patients cannot be put in the typical Fowler position inasmuch as they are accustomed to lying flat on their backs. No food or water is given by mouth, and the stomach is washed out if the patient vomits. Rectal irrigations are given for one-half to three-quarters of an hour every four hours, two long rubber tubes being used, one for the inlet and one for the return. As soon as peritoneal irritation subsides and the function of the intestines returns, careful feeding of peptonized milk is commenced.

It has been observed that in most of the patients who have recovered the temperature has fallen to normal within the first twenty-four to thirty-six hours. It then usually rises and the fever runs its course. Relapses are not uncommon after perforation.

In the five years up to January 1, 1906, 618 patients with typhoid fever were treated at the Roosevelt Hospital; of these, 68 died, a mortality of 11 per cent. There were 33 patients with perforation, 21 of whom were operated upon, with seven recoveries, a mortality of 66.6 per cent; 12 were not operated upon, and all died. Of the 14 patients who died after operation, one contracted pneumonia the day after operation, and one died of a second perforation five days after the operation. One patient, counted as an operative cure, died twenty-four days after operation in a relapse.

There was one recovery after operation in a patient whose perforation had occurred three days before admission to the hospital; this patient, a boy sixteen years of age, seemed to be moribund, the skin was livid and blotched, there was suppurative peritonitis throughout the entire cavity, and the pelvis was nearly filled with fecal matter, two perforations about three millimeters in diameter being found in the ileum. After washing out the abdomen a drain was introduced into the pelvis, and the patient made a satisfactory though somewhat tedious recovery.

Blake has decided from his experience with this boy that he would never refuse to operate upon a case of typhoid perforation unless the patient was actually dying.

ASEPTIC INTESTINAL SUTURE.

A method of intestinal anastomosis in which the contents of the bowel has no possible chance of escaping is described by ROSTOWZEW (*Archiv für klinische Chirurgie,* Band lxxxii, 2) in a fully illustrated article.

The method of circular anastomosis is the following: At each end of the part to be resected an enterotribe is applied, and close to it, next to the piece to be removed, an intestinal clamp. The enterotribe is closed tight and screwed down. Then the bowel is burnt through between the enterotribe and clamp by Paquelin cautery. The mesentery corresponding to the resected portion is ligated and cut through, and the part removed. The enterotribe remains on the end of the remaining portion, and is rubbed over on its free surface with the cautery. In this way the bowel crushed by the enterotribe is burnt so that when the enterotribe is removed there is a "fine, crinkled, transparent seam." The walls of the intestine are fused together, firmly enough to hold the lumen closed. The same procedure is done with the other end of the bowel. The two ends are then laid together, so that the burnt seams lie upon one another, and the suture is begun.

The first suture passes through the entire thickness of the mesentery, at its insertion in the bowel. The following sutures include the serosa and muscularis of the intestinal wall, and are applied so that the suture enters the wall about three-eighths of an inch from the crinkled seam, and emerges not very far from it, including over one-eighth inch of muscularis and serosa. It is then passed in a similar manner through the corresponding part of the other intestine. About nine such sutures are placed on each side of the seam. The sutures are then ligated, closing the intestine entirely. Gentle traction on the middle sutures, aided if necessary by manipulation of the line of suture, will now draw the fused surfaces apart, inside the lumen of the bowel, and a perfectly free passage is left, which has no tendency to result in stricture. The opening in the mesentery is closed as usual, and an additional row of

Lembert sutures placed around the anastomosis for greater assurance. The author has devised special instruments for the rapid and safe performance of the method. By use of the special instruments, lateral anastomosis is performed in a similar manner.

PROCTOSCOPY.

In an article dealing with the benefit to be derived from this method, SULTAN (*Deutsche Zeitschrift für Chirurgie,* lxxxvi, 5) brings up two new points.

The first is the danger of bursting the rectum by an extreme inflation with air. This is to be feared in persons of reduced vitality, with marked relaxation of all the muscles, in the presence of old inflammatory conditions. The accident has been reported several times. Such cases must be excluded from rectoscopic examination. The second point to which he draws attention is a new instrument for obtaining small pieces of tissue from the rectal mucosa, for microscopic study. It consists of a handle bearing a shaft 22 inches long which has at its outer end two small rings like ring curettes, which can be placed at any angle to the handle; after introduction these are brought together, seizing a bit of tissue between them. The instrument differs from similar instruments largely in its length.

STRICTURE OF THE ESOPHAGUS—PLASTIC OPERATION.

Very few cases in which a large defect in the esophagus was successfully filled have been reported, and ROKITZKY (*Archiv für klinische Chirurgie,* Band lxxxii, 2) thinks that the good result obtained by him in such a case was largely due to the formation of a gastric fistula before operation.

The esophagus was closed entirely by a scar from swallowing acid, and it was necessary to make a gastrostomy to feed the patient. Seven weeks later, the stricture having been found impermeable, a plastic operation with a skin-flap was performed. The esophagus was exposed by an incision along the left sternomastoid, and the scar or stricture, which was 4 inches long, split from end to end. Sounds were passed to the stricture from above and below, and each end of the esophagus was opened. A flap of skin with its upper corner near the point of the chin, and its right border along the right sternomastoid, was prepared and turned into the wound so as to surround the scar tissue and both openings, thus forming a tube lined with epidermis. The wound was closed as far as possible, and nine days later the base of the flap was cut through and the external wound closed with drainage. A large rubber tube was left in the stricture and held by one thread to the mouth and by another to the gastric fistula. This tube was left in place for twenty days. A small fistula remained, which closed in a month. Not until then was even liquid food given by the mouth. Sounds were passed four months later and the tube found to be free from stricture. The good result obtained in this case is believed by the author to be largely due to the fact that the gastric fistula permitted food to be given for a month before the esophagus had to be used.

GRITTI'S AMPUTATION ABOVE THE KNEE.

This method, which consists in fixing the patella to the lower end of the femur, with a view to making a firm stump, was almost abandoned, according to BLOCH (*Archiv für klinische Chirurgie,* Band lxxxii, 2), because in the preaseptic era it was difficult to obtain union by first intention, which this amputation requires.

Koerte has performed the operation 35 times—14 for gangrene, 10 for other lesions, and 11 times for injury. Six of the gangrene cases died. Of the remaining cases 14 were reëxamined to determine the ultimate result. Of these, 10 had stumps which were well formed and free from tenderness. One case showed slight and three extreme tenderness. The records showed that the tender cases were those in which there had not been union by first intention, but suppuration of the wound. The tenderness was explained by radiograms which showed the

ends of the bones deformed by growths of stalactites. This is evidently due to inflammatory irritation of the periosteum, caused by the suppuration during healing.

As the good results appear to depend on healing without inflammation, the operation should not be done in cases in which infection of the wound is probable, as, for instance, in destructive crushing injuries. The technique is simple. A curved incision from epicondyle to epicondyle, passing below the patella, forms the anterior flap. The posterior flap is square, at the level of the joint. The femur is sawed through just above the epiphysis at a point where its cross-section is the size of the patella, and after the posterior surface of the patella has been sawed away it is sewed to the lower end of the femur by periosteal sutures. The flaps are both well nourished, and the operation is therefore especially adapted to senile gangrene and to diabetic gangrene. It is the operation of choice in all cases in which uninjured tissues are used for the flaps, and there is likelihood of union by first intention.

SYNOVIA AND MENINGES—SUSCEPTIBILITY TO INFECTION.

The synovial and meningeal spaces differ from the peritoneal and pleural cavities, in that they always contain fluid, while the walls of the latter are practically in contact. The results of experiments on the peritoneum can therefore not be applied to them, and NOETZEL (*Archiv für klinische Chirurgie,* Band lxxxi, 1) reports experiments to determine their resistance.

The articular series were made by injecting minimal doses of pyogenic cocci into the knee-joint of rabbits. Noetzel found that infection would be caused by smaller amounts than needed anywhere else. This is not due to poor circulation, as blood is absorbed quickly from a joint, nor to the synovia, which resembles other endothelia. It is almost certainly due to the character of the synovial fluid, which is thick and mucoid and contains débris of broken-down endothelium. This fluid is an excellent culture medium and contains no bactericidal substances. The bacteria are protected by its mucoid character from the direct action of the serum until they are so increased in number as not easily to be overcome.

The meningeal cavity was inoculated with the same organisms by trephining the parietal bone. A large amount of infectious material was required to cause death, and even in fatal cases no pus was seen. The brain tissue seemed much more susceptible than the membranes. Inoculation of other organs and tissues leads Noetzel to believe that differences in the apparent resistance of various parts depend on physical and not on specific characters.

POSTOPERATIVE OBSTRUCTION.

Intestinal obstruction occurring soon after celiotomy is a not uncommon accompaniment of peritonitis, according to MARTENS (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 6), who reports a number of cases following operations for appendicitis and salpingitis.

The condition is ordinarily dependent on a cord of fibrin constricting or bending the bowel, but may be due to abscess. The distinction between it and peritonitis is not always possible. There is more complete obstruction, and foul-smelling matter will often be found in the stomach even when there has been no vomiting. The stomach should therefore always be washed out in doubtful cases. To prevent the occurrence of obstruction after operation, especial care must be devoted to the study of the entire bowel in all celiotomies. Operations on inflammatory abdominal conditions should be performed early, before suppuration, and no drainage should be left in the abdomen. The bowels should be moved as soon after operation as possible. The condition may set in several days or several weeks after the operation. If obstruction occurs, the only hope lies in prompt operation. If the patient is in very bad condition a fistula may be formed, otherwise the obstruction is relieved and the abdomen closed. The operation gives 30 per cent mortality.

FRACTURES OF THE LEG—EXTENSION.

The results obtained by SCHRECKER (*Deutsche Zeitschrift für Chirurgie*, lxxxvi, 6) are very good. He studied only those persons who belonged to beneficial societies, determining how many of them had aid from the societies, the termination of such aid being called complete cure. This means full restoration of ability to labor.

Fractures of the tibial shaft showed complete cure in 88 per cent of the cases; fracture of the malleoli in 98½ per cent. Treatment by other methods gives cure in 75 and 85 per cent respectively. The treatment consists in weight extension in the long axis of the limb and at right angles to this. Straps are run up the sides of the limb as for the treatment of fracture of the femur, but no board is placed at the foot, as the plaster should embrace the ankle. The bottom of the loop is attached to a cord, which passes through a pulley on the bed-foot, and bears a weight of 20 pounds. A second strip runs along the sole of the foot to the toes, and forming a loop back to the ankle. To this loop a cord passes from a pulley directly above, and to the other end of the cord is attached a 2-pound weight. Other loops are placed around the leg, at positions varying with the seat and nature of the fracture. These support 4-pound weights, which fall over the sides of the bed and hold the bones straight. The *x*-ray picture is attached to the foot of the bed so that the exact seat of fracture is easily referred to at any time.

REVIEWS.

DISEASES OF THE INTESTINES AND PERITONEUM. By Prof. D. Hermann Nothnagel. Edited with Additions by H. D. Rolleston, M.A., M.D., F.R.C.P. Second Edition, Thoroughly Revised. Authorized Translation from the German under the Editorial Supervision of Alfred Stengel, M.D. W. B. Saunders Company, Philadelphia, 1907. Price $5.00.

This exhaustive work of over one thousand pages, originally written by Professor Nothnagel, edited by Rolleston in its first and second editions, now appears again, brought up to date by many additions which Rolleston has made. The chapters upon the chemical processes that occur in the intestines by Dr. Obermayer, and that upon Bacteria of the Intestines by Dr. Julius Mannaberg, still form the opening pages of the volume, which is so thorough and complete in every detail that it is almost too exhaustive for the use of the general practitioner, and forms rather a work of reference to which all who are interested in this subject must turn for authoritative statements as to major and minor points in connection with pathological changes in those parts of the body which are named in the title. From the beginning to the end the additions of Dr. Rolleston are not only numerous but excellent, and in many respects give us information of more value than the original text. Almost every page bears bibliographical references, and the volume closes with the finely printed bibliography, which covers twenty-five pages.

THE EAR AND ITS DISEASES. A Text-book for Students and Physicians. By Seth Scott Bishop, B.S., M.D., LL.D. Price $4.00 net. Philadelphia: F. A. Davis Company, 1906.

In this volume the author has rewritten and enlarged the section on the ear from his previous book on Diseases of the Ear, Nose and Throat. The original design of the work has not been changed, but much new material has been added, the most important of which are the first five chapters presenting the anatomy of the ear. The subjects are presented in a concise and clear manner, and the book is copiously illustrated, a large number of the illustrations being from preparations and sections made by the author.

In the treatment of acute mastoiditis,

we can hardly approve of his excessive use of ice, nor can we commend the employment of counter-irritation over the mastoid. His description of the mastoid operations would seem to indicate that he believes in conservatism, but this is a point to be commended rather than the unnecessary removal of almost the entire temporal bone, as practiced by some of our more radical operators. The chapter dealing with the most important subject of intracranial complications of disease of the ear covers only seven pages and certainly is not up to the standard of the remainder of the book. The chapters dealing with the effects of constitutional diseases and drugs on the ear are particularly good.

The book is designed to meet the needs of the student and general practitioner, a purpose which it will amply fulfil. We can recommend Bishop's book as an admirable treatise on diseases of the ear.

S. MAC C. S.

DISEASES OF THE STOMACH. By Dr. I. Boas. Translated by Albert Bernheim, M.D. Illustrated. The F. A. Davis Company, Philadelphia, 1907. Price $5.50.

The work of Boas in investigating and treating diseases of the stomach is universally known, and the present translation into English of the fifth German edition will place this standard work in the hands of many practitioners who heretofore have not been able to employ it because of their lack of knowledge of the German language. The book is quite an exhaustive one, covering more than 700 pages, and contains not only an index of Diseases but an index of Authors as well. The translator has made a considerable number of annotations and additions to the text in which he expresses his own views very clearly. The volume, it is needless to say, is a standard work which can be read and studied with much advantage not only by the general practitioner but by the specialist in diseases of the stomach; it is well printed and deserves to be well received.

THE TREATMENT OF THE DISEASES OF CHILDREN. By Charles Gilmore Kerley, M.D. W. B. Saunders Company, Philadelphia, 1907. Price $5.00.

Dr. Kerley, who is the Professor of Diseases of Children in the New York Polyclinic Medical School and Hospital, has prepared this book for the general practitioner of medicine and not with the idea of supplying specialists in diseases of children or the undergraduate student of medicine with a book which would be particularly valuable to them. Most of the measures which are advised are those which are based upon his personal experience rather than upon contemporaneous literature. After some general considerations as to the methods of treating children, including their clothing and the general hygienic management of the young, with chapters upon the condition of the new-born and nutrition and growth, the various methods of treatment which are adapted to diseases of the gastrointestinal, respiratory, and circulatory systems are taken up. Then follow articles upon the contagious diseases, or, to speak more correctly, the infectious diseases, the urine, the genitals, diseases of the nervous system and diseases of the skin, and then the diseases of special organs, such as the ear. Curiously enough, there is no chapted devoted to diseases of the eye, and equally curiously, the chapter upon the contagious diseases is separated by more than 115 pages from that upon the infectious diseases. We note with interest that cyclic vomiting is classed as one of the infectious diseases, as is also acute general peritonitis, tuberculous bone disease, and dactylitis. Surely this must be an error. The volume closes with a discussion of the temperature of children and the methods controlling it when it becomes febrile, with a discussion of gymnastic therapeutics, and finally a list of drugs for internal and external use. This book contains a very large number of useful hints from which practitioners may gain much that is of value.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.A., M.D.

The most recent event in the hospital world of London is the opening of a large new block of buildings at St. Bartholomew's Hospital, which had already the distinction of being one of the largest hospitals in the metropolis. The new portion is a six-story building, which is to serve as out-patient and casualty department, and contains also rooms for the resident medical officers. This, of course, sets free a considerable part of the older buildings, and no doubt these will be quickly utilized; for since the fiasco of the proposal to centralize all teaching in the preliminary subjects of medical study in London, St. Bartholomew's Medical School has refused to take any part in the scheme and will remain a complete school for teaching in all subjects of the medical curriculum. One of the arguments advanced in favor of the now wrecked scheme was that if the hospitals would give up teaching the elementary scientific subjects, much valuable space in these institutions would be set free for medical research, but this argument carried less weight than did the possibility of having less students, and less fees, so several of the larger hospitals withdrew from the scheme, which was thus rendered futile for those hospitals which had already pledged themselves to it.

The ceremony of opening the new building took place a few days ago, when the Prince and Princess of Wales performed the function, and the Prince made an interesting speech, in which he stated that this hospital, now nearly 800 years old, was founded by the court jester of Henry I., and had been in favor with all monarchs since, except perhaps Henry VIII., who had thoughts of turning it into cash. The Prince referred to the outcry which there was a short time ago in favor of removing this hospital to some other part of London, and said that "Bart's" is where it ought to be, and where it is likely to remain. The Lord Mayor and sheriffs of London attended in state, and Lord and Lady Ludlow, the former the treasurer of the hospital, received the chief visitors.

The Royal College of Surgeons has just reëlected Mr. Henry Morris as its president; this is his second year of office. Mr. Rickman Godlee and Mr. Watson Cheyne are the two vice-presidents.

The medical profession will be somewhat disorganized in London during the next two weeks, for next week the British Medical Association is to hold its annual meeting, this year at Exeter; while the following week the Second International Congress on School Hygiene is to be held in London under the presidency of Sir Lauder Brunton; and in connection with both these meetings there is to be the usual series of mild dissipations—picnics, garden parties, and receptions. At the Exeter meeting there is to be, I hear, a presentation of the Middlemore prize for recent work in connection with contagious diseases of the eye; the prize is adjudged to Mr. Sidney Stephenson. Next week also the British Association for the Advancement of Science is to hold its annual meeting, which is to be at Leicester. One of the subjects to be discussed is the physiological and therapeutic uses of alcohol. One would have thought this threadbare subject—threadbare only as a cloak for exaggerated statements of faddists—had already become tedious, but Sir Victor Horsley and Prof. Sims Woodhead are to the fore again. One wonders whether the sameness of proceedings will be varied by the presence of any of those gentlemen who signed the manifesto in favor of the occasional usefulness of alcohol a few months ago.

An interesting advance in anesthesia has been made lately in the production of analgesia by injection of various drugs into the

spinal theca. The chief exponent of this method in London at the present time is Mr. Canny Ryall, who, however, employs a different drug from that mostly used. Hitherto stovaine has been used for this purpose, but Mr. Ryall employs novocaine. Amongst the operations which have been performed with this form of anesthesia are such major procedures as prostatectomy and appendicectomy. The skin is frozen in the lumbar region and novocaine then injected into the spinal cavity; in five minutes all feeling of pain is obliterated in the abdomen and lower limbs. The patient who was undergoing prostatectomy chatted during the operation, and was able to talk and laugh at the end of it. It is stated that there is little or no shock from operation; and the analgesia can be maintained, Mr. Ryall says, for fully six hours.

Professor Osler recently spoke at a meeting in support of a consumption sanatorium, and stated that 55,759 persons died in England and Wales from tuberculosis during the year 1905. He thought that open-air treatment might be carried out successfully at the patient's own home if sanatorium treatment was not available. He said that the public has an undue fear of such places; there are fewer tubercle bacilli in a square yard in a well-managed sanatorium than in any other place in the community. An excellent step has been taken by the London County Council recently in deciding to establish an open-air recovery school at Plumstead, one of the suburbs of London, for the children of the poor.

The Therapeutical Society, which like so many others of its fellow societies has recently become submerged—or should we say has blossomed forth?—into a section of the Royal Society of Medicine, made an excursion to Oxford this month, where it need hardly be said the Regius Professor, Dr. Osler, added greatly to the pleasure of the therapeutists by his genial presence, and by welcoming them at a garden party at his own house.

The month has brought heavy losses to the profession by death. Three physicians of world-wide fame have passed away—two in this country and one in Paris. Sir William Broadbent, who was perhaps best known in connection with his work on heart disease, had attained to high honors: he was Physician Extraordinary to Queen Victoria and Physician in Ordinary to our present King. Honorary degrees were conferred on him by English and foreign universities, and in addition to the baronetcy, which was conferred upon him by Queen Victoria, he had been honored in France with the insignia of a commander of the Legion of Honor. As a teacher and clinician he was held in the highest regard by the students of St. Mary's Hospital, to which he was for many years physician. He died this month at the age of seventy-two years.

Sir William Gairdner, who was Physician in Ordinary to the King in Scotland, had reached the ripe old age of eighty-five years when he passed away. As professor of clinical medicine at Glasgow he was recognized as one of the foremost physicians of the day, and his writings were numerous and valuable.

The third physician to whom I referred was not an Englishman, but his name was honored in this country by all who are specially interested in diseases of children, so that I cannot refrain from some reference to him—Professor Grancher, who was clinical professor of children's diseases in Paris. He has just passed away after a long life spent chiefly in attempting to improve some of the conditions of child life in France, especially to procure open-air schools for children.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., OCTOBER 15, 1907. | Third Series, Vol. XXIII, No. 10.

ORIGINAL COMMUNICATIONS.

APPENDICITIS SIMULATING SACROILIAC DISEASE AND SCIATICA.[1]

BY J. TORRANCE RUGH, M.D.,

Associate in Orthopedic Surgery in the Jefferson Medical College; Orthopedic Surgeon to the Methodist Hospital; etc.

We are more prone to look upon referred pain as being an accompaniment of the chronic type of disease than of the acute, though it probably occurs as frequently in the latter as in the former. The chief difference may be said to lie in the fact that in many tubercular and chronic forms of disease referred pain is the rule, while in the acute conditions it is the exception. This being the case, the clinician must be on constant guard to avoid being misled by the mask of false locations. Symptoms are constantly changing in the same condition, and when one hears of or meets with a case of appendicitis, the mind is immediately centered upon the abdominal cavity, and in the great majority of instances upon the right inguinal region. When, however, a group of symptoms is presented which is totally removed from that area, and which is very commonly associated with conditions occurring as frequently as appendicitis, or perhaps more so, the vast majority of clinicians will diagnosticate the disturbance as involving the regions in which the symptoms occur. On this account attention should be directed to any unusual manifestations of more or less common conditions, that the clinical mind may be alert to the possible reflection of the subjective evidences of disease. It has been my privilege to see three cases recently, which, while rare in their occurrence, yet because of the serious consequences which might result merit record in surgical literature. The first one is as follows:

In May, 1905, A. H., female, aged seventeen years, was brought to me by Dr. R. W. Brace because of a limp in the right leg which had been present for about a month, and was *intermittent*. She gave a poor family history, though tuberculosis was not present. The patient was of normal size and presented the appearance of having enjoyed good health. There was no history of an injury immediate or remote, nor of any other exciting or predisposing cause for the condition. There was no disturbance of digestion and no history of attacks of pain or discomfort in the abdomen. The trouble came on gradually, without apparent cause, and was pronounced when I saw her. Examination showed normal function of the hip-joint and entire absence of tenderness and pain, either local or referred. Over the right sacroiliac joint there was an area which was very slightly sensitive, and when pain was present it was located here. Slight muscular rigidity was present on the right side of the lumbar spine, and the patient favored that side in stooping or moving. Lateral pressure on the iliac crests gave a suggestion of soreness in this articulation, and coughing or jarring likewise caused slight pain. The temperature was 99.5°. A blood count was not made. The grouping and localization of the symptoms about the back of the pel-

[1] Read before the Camden City Medical Society, Feb. 5, 1907.

vis and the absence of any other demonstrable lesions were strongly suggestive of incipient sacroiliac disease, and this diagnosis was finally made and appropriate treatment advised. Not being in circumstances to rest in bed and be treated at home, she was sent to the Orthopedic Hospital, where she came under the care of Dr. G. G. Davis, and to him I am indebted for the subsequent history. He writes: "A. H. was admitted to the hospital complaining of the hip. She had pain in the hip and impaired flexion and rotation. Coxalgia was at first suspected, but later examination revealed appendix symptoms, and this organ was removed on July 22, 1905. It was found to be inflamed and contained a fecal concretion. Primary healing and satisfactory convalescence followed, and she left the hospital cured."

Later inquiry through Dr. Brace found her in excellent health and with absolutely no symptoms of the former condition.

The history and course of this interesting case are rather unusual because of the absence of any symptoms pointing to appendiceal involvement. There was nothing to indicate intestinal disturbance, while all symptoms were highly suggestive of incipient disease of the sacroiliac symphysis. The later development of pain in the hip with limited motion in the joint was sufficient to warrant suspicion of more or less serious trouble in that part, and much support was given this theory by the insidious character of the onset and the *intermittency* of the limp. Had the appendix been examined when she was first seen by me, no doubt the true condition would have been determined, but the absence of symptoms directly referable to that part threw us all off guard.

The next case, somewhat resembling this one, came under my observation on August 30, 1906. It occurred in the service of Prof. J. Chalmers Da Costa, in the Jefferson Hospital, and with his permission I publish it. The history in the hospital records is as follows:

"G. D. R., aged thirty-eight years, a carpenter. Family history negative. Had all the diseases of childhood, but was a healthy man until in January, 1906, when he was seized with pain in both gluteal regions. This lasted for five days and was very severe. Three weeks later the pain again appeared, but only in the right leg, and was severe and sharp in character. He received all kinds of treatment for it, but without relief, and on his admission to the hospital (July 25) he complained of its localization at the greater sciatic notch, over the sacroiliac symphysis, and on both sides of the tendo Achilles. On July 28 Dr. Da Costa, through an incision over the right sacroiliac joint, gouged away part of the ilium. The bone appeared lighter in color and softer than normal. Iodoform gauze drainage was inserted, the muscles were united by sutures, and the wound closed. The sciatic nerve was then stretched through an incision in the upper and posterior part of the thigh. This incision was closed without drainage. Both wounds healed without complication, the lower one by first intention and the upper one by granulation. It was packed for two weeks. In spite of the treatment the pain persisted, and on August 18 a 2-per-cent solution of osmic acid was injected into the sheath of the right sciatic nerve just below its exit from the pelvis. On the 19th the leg was placed upon a double inclined plane, but this had to be removed by evening because of pain. On the 21st a long straight splint was applied on the outer side from the axilla to the ankle, but the pain continued in spite of what was done."

At Dr. Da Costa's request I saw the patient on the 30th of August, and profiting by the knowledge of the case first described, I examined the appendix and found it tender. I also obtained a history of repeated attacks of "stomach trouble" during the past year, which had been pronounced *intestinal indigestion* by a very capable diagnostician and teacher of this city. I ventured the diagnosis of chronic appendicitis with reflex pain projected along the lumbar and sciatic plexuses. On September 1, two days later, Dr. Da Costa removed the appendix, which he found lying across the

psoas muscle and almost entirely retroperitoneal, there being no mesoappendix excepting for about a half-inch at the tip. There were some old adhesions between the intestine and the peritoneum. The appendix was sacculated and cystic in one portion. Recovery was uneventful and entire relief from pain followed. Three months after operation I learned he was in excellent health and had had no return of his pain.

In this case the trajection of the pain was so complete as to entirely mask the true cause of the trouble. As in the case first detailed, there were no acute attacks of sufficient severity, or presenting sufficiently prominent local symptoms, to attract the attention of the attending physician to the real seat of the trouble. In his latest work on appendicitis, Deaver (p. 325) details a case as occurring in the service of Dr. Harry C. Deaver at the Episcopal Hospital in which the pain was referred entirely along the right sciatic nerve, but presenting symptoms of gastric and intestinal disturbance and preliminary abdominal cramp. "Operation revealed the appendix lying across the psoas and iliacus muscles behind the cecum, subserous, and its tip nearly reaching the iliac crest. There was a large abscess running up toward the liver. . . . On recovery from ether the pain in the thigh had disappeared. Death from septicemia occurred on the fourth day after operation."

In the article on appendicitis in Nothnagel's Encyclopædia of Practical Medicine there occurs the following: "From this region (right lower half of the abdomen) it (pain) may then radiate into every one of the regions mentioned or into the lumbar region, the testicle, the sacral region, the bladder, and especially down the right leg."

Kelly (Appendix and Its Diseases) calls attention to several striking cases in which appendicitis and coxalgia have been confused, but does not refer to the involvement of the sciatic or other nerves of the leg and thigh. Deaver (*loc. cit.*, pp. 221 and 222) believes that the reflection of the pain is in the main dependent upon the position occupied by the appendix, and discusses in detail the relationship between the two. In the event of adhesions being the source of pain, their location will likewise determine the direction in which the pain will be trajected.

Dr. George J. Schwartz very kindly furnished me with the following notes of a case under his personal care which is analogous to the cases reported above, though presenting later marked abdominal symptoms. The personal history is negative prior to July 20, 1904. At this time, after eating dried apples, he complained of slight headache and abdominal pain. Both disappeared after a dose of castor oil, but one week later, after a prolonged swim, the pain returned in the abdomen and the right leg. After a purgative was taken the abdominal symptoms disappeared, but the pain in the leg remained, and finally, after three weeks, unilateral backache appeared on the right side. This continued intermittently for two and one-half years, when Dr. Schwartz saw him. At this time (January, 1907) his temperature, pulse, and respiration were normal. There was no tenderness over the abdomen, either localized or general. He had colicky pains in the abdomen with involvement of the right sciatic nerve, and tenderness over this structure in the sciatic notch, popliteal space, and back of the ankle. There was also pain between the third and fourth metatarsals, which was made worse by squeezing the foot laterally. The nerve between these bones was resected, but without relief. Learning of the case of Professor Da Costa above mentioned, Dr. Schwartz then examined the abdomen carefully and was able to elicit tenderness over the appendix by deep palpation. In February, 1907, he removed a diseased retroperitoneal appendix, and the patient was immediately relieved of his pain and has had absolutely no recurrence of it.

The following case was undoubtedly one of referred pain due to rupture of adhesions following appendectomy, and illustrates the danger of mistake if the possibility of the referred pains is not kept in mind:

B. D., aged twenty-four years, was oper-

ated upon January 31, 1906, for acute suppurative appendicitis. His recovery was uneventful, and he resumed his work in a laundry in due time. On July 20, 1906, while lifting a heavy weight, he was attacked by a severe pain in the right side, radiating from the region of the wound to the iliac crest and toward the sacrum. The pain was excessive at the time, and numerous other similar attacks were precipitated by attempts to lift heavy objects. He came to the Jefferson Hospital, and I saw him in the Orthopedic Department, where he had been sent for examination of the spine. He presented no evidence of sacroiliac disease or of any inflammatory involvement of the spine. There was no muscular atrophy in the neighboring parts, and the hip-joint was freely movable. His temperature was 100°, and there was a slight mass in the right iliac fossa which was somewhat tender. A return of the old trouble was at first suspected, but later this proved to be the organized inflammatory exudate resulting from the operation which had been irritated and aggravated by the injury received during lifting. The sudden onset of the pain while making severe muscular effort, with the localized thickening and slight sensitiveness, pointed strongly to rupture of adhesions with projection of the pain along the lumbar and sciatic plexuses. The last attack of pain occurred while he was bending over a board and was located in the hip, and radiated down the back of the leg to the foot. It lasted for about a day and a half and occasioned considerable suffering. He is now free from these attacks, as he has changed his occupation to one which relieves him of all strain. The mass in the iliac fossa has also disappeared, and he feels no discomfort.

THE ERADICATION BY SURGICAL MEANS OF THE NASOLABIAL LINE.

BY CHARLES C. MILLER, M.D., CHICAGO.

The nasolabial line is seen quite frequently in comparatively young women. It is an expression line which changes the appearance of the entire lower face and may well engage the attention of the surgeon.

A few years ago attempts were made to eradicate this line by filling along the fold with paraffin, but this is not an entirely satisfactory operation—in fact, it is almost invariably a failure. Simple filling of the tissues along the bottom of the crease seldom produces even a temporary eradication, but the successful depositing of a thin plate under the tissues of the skin for a considerable distance on either side of the line may so stiffen them as to overcome it, but this is accomplished with difficulty, as paraffin tends to lump in these soft tissues and does not spread accurately, and we have not the means here to influence it as we have in other parts where it is more accessible. Paraffin protected by bulky soft parts cannot be molded accurately.

Nasolabial lines are due in large part to the excessive action of the muscles external to and above the nasolabial line, and a subcutaneous section made external to this line and parallel to it will divide more or less perfectly these fibers. Successful division of these fibers diminishing their action will remove to a degree the cause of these lines; then eradication may be aided somewhat by a plastic operation within the mouth, and a condition of the parts may be attained which will predispose toward the complete disappearance of the lines if they have not become too deeply marked.

To accomplish the subcutaneous section of the fibers the sectioning knife may be entered at several points. This knife should have a very narrow blade, and in the absence of a better instrument the Graefe cataract knife may be used.

Entered externally the knife makes so small a wound that the scar should not be noticeable subsequently, but should the operator care to take the very slight chances of an infection and subsequent inflammatory action the fibers may be divided

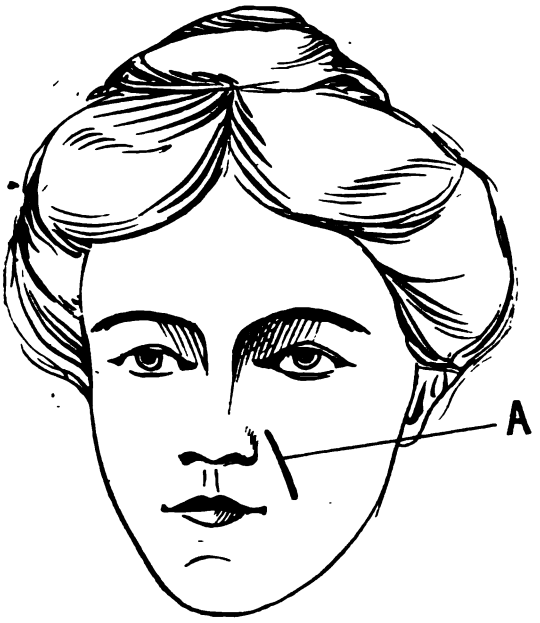

FIG. 1.—Illustrating line of subcutaneous section of facial muscles external to the nasolabial line. The knife is more conveniently entered from below.

through an incision made within the mouth. The division when made from within is not accomplished with the same degree of accuracy as when the knife is entered through the skin, as it is possible from this latter entering point to carry the blade along beneath the muscular fibers and then to divide these fibers in a line directly parallel to the nasolabial line. When the knife is carried through the tissues from within the division must be made with its point, and this interferes with accuracy and thoroughness. When the section is made through a puncture in the skin the knife should be entered at what I may term the dimple point—that is, the point where a dimple develops or should develop when the patient smiles. The knife is carried along parallel to the nasolabial line and should pass in deeply, so that it approaches very close to the mucosa. Section is accomplished by a sawing motion, and the edge of the knife, not the point, should accomplish the division. When the edge approaches close to the skin it is withdrawn and pressure applied externally to control subcutaneous bleeding. The puncture in the skin is sealed with a drop of collodion.

The sectioning is repeated on both sides, and then the lip is turned upward by an assistant, and after infiltration the mucosa is incised in a semilunar direction. The convexity may be in either direction, the section beginning beneath the alæ nasi and extending downward for about three-quarters of an inch so that it terminates about one-eighth of an inch above the angle of the mouth. This interval in the mucosa is deepened by as blunt a dissection as possible, so that as few of the blood-vessels as possible are divided. The angles of the semilunar incision are brought together so that the tissues are bunched under the nasolabial line.

It is a simple matter to make the incision with the convexity downward, but the operator must remember when the incision is so made that the completion of the operation may alter the appearance of the lips to a disadvantage. If this is likely to occur he should elect the opposite course, although it will be somewhat more difficult to close the incision when made high up unless the surgeon has at hand an assistant

FIG. 2.—Illustrating the mucous membrane incision beneath the nasolabial line. A A are to be brought as closely together as possible, bunching the tissues under the nasolabial line and elevating the depressed angle of the mouth.

capable of retracting the lip for him satisfactorily.

The operator may find it more convenient to do the plastic operation within the mouth first and section the fibers external to the nasolabial line subsequently. This is a matter of election.

Compression with a bandage is indicated for a few hours after this operation to minimize subcutaneous bleeding. These parts are vascular and bleeding beneath the skin is to be expected. If compression is used no complication need be feared from this bleeding.

ERRORS IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE SKIN—DON'TS IN DERMATOLOGY.[1]

BY L. DUNCAN BULKLEY, A.M., M.D.,

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In my last lecture I endeavored to give you some practical points regarding the diagnosis and treatment of diseases of the skin as they have occurred to me after many years' observation; at that time I mentioned a number of items positively which in a negative way I might have reserved for this lecture. So if I shall now seem to at all cover some of the same ground I trust that you will bear with me, for we all know how difficult it is to grasp all the points of a lecture, and also that good things will often bear repetition.

I want now to call your careful attention to some of the errors which may occur in the diagnosis and treatment of diseases of the skin, as they have been observed by me in the past years, and finally to sum up these two lectures in a series of "Don'ts in Dermatology," which may help some of you to avoid certain of the errors mentioned.

As I remarked last week, it is an error to regard manifestations of disease on the skin too lightly, and to say, "Oh, it is only some skin trouble," and then to prescribe only arsenic and zinc ointment; for as I have repeatedly shown in these clinics and elsewhere, this method will not give good results. I shall also hope to show in my next lecture that there are danger-signals from the skin which it is our duty toward the patient to heed, and which may be followed by serious consequences if not correctly interpreted and acted upon. A correct diagnosis, therefore, should always be arrived at if possible, although, as I well know from personal experience as well as from experience in the New York Dermatological Society, this cannot always be absolutely accomplished at first inspection.

It is an error not to recognize that a patient may often have more than one cutaneous ailment at the same time, and that one of them may mask the other and create confusion in diagnosis. I have on repeated occasions shown you in the clinic patients who have had several distinct cutaneous diseases, and on one occasion I lectured on a case in which there were five or six entirely different kinds of skin lesions, to each of which a different diagnosis would properly be given: this, of course, included such a minor affair as warts, or verruca.

As an illustration of the simultaneous occurrence of two eruptions which may cause confusion in diagnosis, I may mention the existence of *eczema, pruritus,* or *scabies* in conjunction with syphilis. The itching caused by one of the former eruptions can very easily raise doubt as to the true character of syphilitic lesions which may be present, for these latter rarely if ever itch, and the symptoms belonging to each must be very carefully differentiated.

Syphilis has been called the great imitator, and its lesions may often simulate and resemble those of many other skin affections; many errors, therefore, constantly occur in regard to its diagnosis, some of which I will try to mention.

[1] Lecture delivered at the New York Skin and Cancer Hospital, April 8, 1907.

Beginning with the initial lesion of syphilis, errors are continually made in two directions: First, in not recognizing the nature of the primary sore, especially in extra-genital regions; and secondly, in regarding as syphilitic lesions others which are of quite different nature, such an *chancroid, herpes progenitalis, balanitis,* etc. The latter error is much less common, but if made it will subject the patient to much anxiety, and possibly to an unnecessary course of syphilitic treatment. In regard to the recognition of the initial lesion of syphilis, it must be confessed that this is often a very difficult problem in many instances; and in accomplishing this much care must be exercised, while indeed it sometimes cannot be decided until after the appearance of some of the constitutional manifestations of the disease. There are many who are well acquainted with syphilis who claim that constitutional treatment should never be instituted until this occurs. In doubtful cases this is the wisest course to pursue, as it is questionable if any time is lost by being thus certain; for when induration has sufficiently developed in the primary sore to make the diagnosis perfectly certain, the system is already thoroughly infected.

In regard to extra-genital sores it is possible that in relatively few instances is a correct and absolute diagnosis made before the occurrence of the eruption; indeed, as a rule, it is the discovery of the eruption and its recognition as syphilitic which leads to the search for the site of infection, which can generally be determined if sufficient care and effort are expended. Only yesterday I saw for the second time, in consultation, a patient whom I had seen eleven days before, with a maculopapular eruption of such unusual form and distribution that I could not believe it to be syphilitic. I therefore entered the diagnosis as *dermatitis medicamentosa,* since he has been taking some remedies which I thought might have produced the rash: he was constipated, and had a coated, indented tongue. He had been married three years and had not been exposed venereally, and at the first consultation I could find no trace of an initial lesion of syphilis anywhere. As the eruption remained and increased I was asked to see him again; some of the papules now suggested syphilis, and on the scrotum one had formed a mucous patch. He was stripped entirely, and examined from head to foot minutely for the primary sore, which was not found at first. Some enlarged postauricular glands and others in the neck led me to examine the mouth and throat again more carefully, and on drawing out the tongue greatly there was an ulceration found low down on the right side, with some soreness of the left; the right tonsil was distinctly hard when felt with the finger; and the diagnosis was complete. He tended a liquor bar, in a very bad section of the city, and undoubtedly had acquired the throat chancre from an infected drinking-glass.

Extra-genital chancres on various parts of the body present such varying aspects, as some of you have observed from the cases which I have presented in the clinics, and from the models and pictures which I have passed around, that it is difficult to give concisely any perfect description of them, and I must not dwell on this topic much longer. I may tell you, however, that errors in regard to their diagnosis have often occurred, and chancres of the lip and eyelid have frequently been excised as *epithelioma,* of which I have personal knowledge; on the tongue they are also often thought at first to be epithelioma. Occurring on the bearded face, by infection in shaving, I have known them to be long treated for parasitic *sycosis,* and when appearing on the fingers I have also known them to have been incised, as some sort of an inflammatory process. I have seen a number of cases of chancre of the tonsil which had been regarded and treated as diphtheria or tonsillitis.

Errors also in the way of regarding as syphilitic certain cutaneous or other manifestations which prove to be of quite a different character are of not infrequent occurrence. A practitioner asked a certain gentleman well versed in venereal diseases,

together with myself, to see in consultation a patient whom he believed to have a chancre in the urethra; and inasmuch as what he had regarded as a copper-colored eruption was observed on the chest, he thought that the diagnosis was confirmed. Endoscopic examinations showed no chancre, but only a gonorrhea, and a microscopic examination of some scales scraped from the eruption on the chest proved it to be *tinea versicolor;* the patient had no syphilitic infection. I have repeatedly known the eruption caused by copaiba, administered for a gonorrhea, to be mistaken for a macular syphilide.

Errors have also repeatedly happened under my observation in mistaking an eruption produced by iodide of potassium for one caused by syphilis, and the remedy has been pushed more and more as the eruption seemed to increase. I have also seen the same occur in the use of the bromides.

Later in syphilis one constantly sees errors, more commonly in the failure to recognize the disease when existing, but also occasionally in regarding non-specific lesions as syphilitic. Do not forget what I mentioned about syphilis being an imitator of other lesions, and in cases which are at all doubtful expend any amount of energy and patience in order to make a correct diagnosis.

Eighteen months ago a gentleman, aged forty-five, was sent to me from a distant city with a mass of ulcerative disease about the lower abdomen, groins, upper thighs, and buttocks which almost defies description, and which had been variously diagnosed. He had been married eleven years, had a healthy child of ten, and his wife had had no miscarriages. The trouble, which had begun on the scrotum ten years before, had progressed steadily all the time up to his visit, in spite of continuous and most varied treatment from many physicians: this had included long courses of *x*-rays and Finsen light, injections of antitoxin twice a week for four months, all kinds of local treatment, including severe cauterizations, and latterly it was seriously proposed to excise the entire area and treat it with skin-grafting. There were in all several dozen square inches of deeply ulcerated surface. To be brief, syphilis had never been suspected, and yet the entire surface was absolutely healed at the end of three months, under very active mixed treatment, with absolutely no local applications except absorbent cotton, and the use of peroxide of hydrogen twice daily.

Late syphilitic lesions about the face are most commonly mistaken for *lupus* and *epithelioma,* and I have seen very many which had been thus treated, often with *x*-rays in late years, quickly yield to proper antisyphilitic treatment. Epithelioma will sometimes develop upon an old syphilitic lesion, especially on the tongue, and the diagnosis may then be very difficult. I have spent so much time on syphilis that I will have to be more brief than I could wish in regard to many other matters which I desire to mention; so pray pardon me if I speak rather dogmatically.

So relatively simple a disease as *scabies* is often the cause of many errors, as all practicing dermatology must often observe. I cannot here enter into its differential diagnosis, which I have often demonstrated to you in the clinic, but let me remind you that we constantly find it even in the higher walks of life: many a patient has been treated a long time with various internal remedies, when a brief course of proper local treatment has ended the trouble promptly. The same is true in regard to *pediculosis* both of the scalp, body, and pubis, as I have seen time and again: in a number of instances a prolonged itching, with some raw lesions about the scalp and ears, where the trouble had been regarded as *eczema,* was found to be of this nature, and everything was quickly cured by correct treatment.

Errors also constantly occur in regard to the vegetable parasitic diseases, and I have already mentioned an instance in which *tinea versicolor* was thought to be an evidence of syphilis. Many a case of *ringworm* of the scalp has been long undiagnosed, and I must confess that in certain cases, both of this disease and *favus,* it is extremely difficult to make a positive

diagnosis without the aid of the microscope; so let me urge you to make constant use of this means in cases which are at all doubtful. Some time ago a physician teaching dermatology in another city sent me a patient with a little hard, crusted patch on the left cheek, beneath the eye, for my opinion as to the desirability of its excision, as an *epithelioma*. The crust seeming peculiar I picked at it, and found that I could raise it entire; placing some of it properly prepared under the microscope, it was seen to be wholly composed of the spores and mycelia of *favus*, and the whole affair yielded very quickly to a little antiparasitic ointment. Such a case is indeed rare, as is also favus elsewhere than on the scalp, but I mention it to show how errors can be avoided.

Quite a common error often occurs in regard to chronic erythematous *eczema* of the face, which time and again I have known to be called "chronic erysipelas" by former medical attendants. You know perfectly well that erysipelas is an acute infectious disease, and these cases should never be thus wrongly designated and treated. The same term is sometimes erroneously applied to diffuse *acne rosacea*. There is also a *pseudoerysipelas*, a diffuse lymphatic infection from nasal disease, which recurs again and again about the nose and center of the face, and which is also often wrongly called true *erysipelas*. Its whole course is quite different from true erysipelas, and if it is so designated and its real nature is not recognized, and if the nasal cavity is left untreated, the trouble may recur indefinitely. I have repeatedly been called to the hospitals in regard to cases suspected to be erysipelas, and therefore so isolated, which were found to be only a general erythematous eruption due to pus absorption, or one of general irritation of the skin caused by the use of iodoform in dressing.

The *exanthemata* should not often give great difficulty in diagnosis, when all the symptoms are appreciated and analyzed, although occasionally errors will be made. Several times I have discovered *smallpox* in a patient in a hospital, where the disease had not been suspected, but where the rash had been supposed to be a simple affair. On the other hand, when in Vienna many years ago during a great epidemic of this disease, Hebra constantly found in the wards patients who had been sent in for smallpox, in whom the eruption was of quite a different character. Somewhat the same happened recently in connection with the hospital. There came to the out-patient clinic a patient in whom the eruption was so very suspicious that the Board of Health was notified, and the case was regarded as smallpox and taken in charge; but after a few days of observation it was decided not to be smallpox, and he was discharged and came to the clinic. I did not see the patient at the time, but understood that the eruption was probably *erythema papulatum*.

Not very long ago I was called to a neighboring city to decide in regard to a case of suspected *scarlatina* which had been quarantined during an epidemic of the disease there, the health officer agreeing to accept my verdict. The child, who had been attending school, was found to have a desquamation, affecting principally the hands, very suggestive of that of scarlatina, with some of the same on various parts of the body. But on investigation it was found that on several occasions before she had had similar attacks of shedding the epidermis, without previous fever or other apparent illness, and her father was also subject to the same. The decision was against scarlatina, as subsequent events proved. This was a rare and curious case, but it shows how careful one must be to investigate and understand everything relating to a patient, and not to judge from a single symptom.

Eruptions caused by the internal administration of drugs are not infrequently the cause of errors in diagnosis. I have already mentioned these from *copaiba* and *iodide* and *bromide of potassium* as being mistaken for syphilitic manifestations. I have repeatedly seen an eruption from quinine which could with difficulty be distinguished from that of scarlatina, as may that from belladonna, while those from the coal-tar products are often mistaken for the eruptive fevers; the eruption following

injections of antitoxin are now pretty well known.

Dermatitis venenata, or the eruption caused by poison-ivy and other plants, is often mistaken for *acute eczema,* and much unnecessary internal treatment is sometimes given for the purely local phenomena. Some time ago I knew of a rather ludicrous error arising on account of poisoning with ivy. A bridal couple were on their wedding journey, and somewhere in the woods the husband, in answering a call of nature, came in contact with poison-ivy, and as a result was very severely poisoned about the genital region, with enormous swelling and inflammation of the parts. The young and innocent bride, imagining that any trouble in that region indicated something of evil origin, was greatly excited, and telegraphed to her parents to come and take her home, as she had been greatly deceived and wronged. Fortunately a skilled dermatologist at once recognized the difficulty and the episode ended satisfactorily.

Of course there are a large number of other affections of the skin in regard to the diagnosis of which errors are often made, but I must not linger longer on this part of the subject. These that have been mentioned are sufficient to indicate the caution which I have so often urged upon you, and emphasized in my last lecture: namely, that much care and thought should be bestowed on dermatological cases, the individual primary and secondary lesions should be studied carefully, the whole surface being examined, and the history accurately learned; also that a mental process of exclusion of other possible eruptions at all similar should be made, and the diagnosis established with certainty before prescribing. This may seem to be commonplace and useless advice, but experience has taught me that it is necessary to urge it upon you.

Turning now to *errors in treatment,* we may best consider them under the two natural heads of constitutional and local measures. Here let me say that much of the unsavory reputation which diseases of the skin have for chronicity and rebelliousness is due very largely to errors in diagnosis and treatment. Both are partly to blame, but I believe that the latter (treatment) may be rightly charged with the greatest share. The diagnosis is often correctly made, but, pardon me for plain speaking, I think that the shockingly poor treatment which most cases receive accounts largely for their rebelliousness. This poor treatment, as I have already intimated, commonly comes from too little thought and study being given to the cases; since diseases of the skin are too often regarded as light and trifling affairs, and the patient is put off with some local application and little else.

Case-taking and carefully written records made at each visit before prescribing would, I am confident, remove much of the trouble. These notes should include a statement of the patient's condition in every particular, in regard to all the functions; they should embrace more or less of a description of the skin lesions then present, and certainly the treatment given at the last visit; and then, on the basis of all this, the prescription, abbreviated if necessary, is written in the notes and a full copy given to the patient, with exact directions as to the use of the remedies prescribed. Only in this way can one correctly follow a case to a cure; and in this way a cure will be much more likely to follow than when matters are treated in a haphazard manner.

It is granted that many diseases of the skin are more or less rebellious to treatment, and it is a fact that very many of them show no tendency to self-limitation, at least while the patient remains in the same conditions of life as before, or until the skin is forced into a healthy action by vigorous and prolonged treatment. But I am one that believes firmly in the efficiency of proper treatment. I have watched the matter for years, and I believe that medical acumen should discover where the error lies, that medical skill should devise the ways and means of overcoming what is wrong, and that medical energy should see that these measures are properly carried

out. So you see I am an optimist and not a pessimist in therapeutics.

This leads us to a consideration of general therapeutical measures for the cure of many diseases of the skin. I know that some of them are purely local in character, as *scabies,* and these will be spoken of later; but I wish now to speak of errors which constantly occur regarding the management of very many cases which unmistakably have constitutional relations which are of prime importance to treat in order to have the best success, or indeed any very satisfactory result.

I dislike to reiterate so much that I have said in my lectures last year and the year before, but I must briefly state again that I find it a constant error in regard to the previous treatment of cases which I see that so little attention has been paid to the patients themselves, to their physical condition, and the performance of their functions of life. I continually find patients with various skin affections to be in a deplorable state as far as their digestion, metabolism, and elimination are concerned; and I frequently find those whose dietary and hygienic conditions are dreadfully wrong. Now while all these may not always be the direct exciting cause of the eruption, I know from experience that they have a very great bearing on recovery from the cutaneous disturbance, and I know also that the latter often recurs when there is a relapse in regard to the former.

As a corollary to this it follows that an error is made when any line of internal treatment designed to benefit the eruption is continued regardless of the condition of the patient's system from time to time. Many a time have I seen the same tonic or alterative treatment persisted in, when it was entirely unsuited to the patient's present condition, when there was gastric or intestinal disturbance, or when the kidney secretion was grossly deranged. In almost every case the exact prescription must be planned and suited to the needs and requirements of the system at each particular time, and no remedy or combination of remedies can be always suitable to every case, any more than the same sized shoe can be comfortably worn by every member of a regiment of soldiers. This may seem to be a trite and commonplace remark, but I am sure that it is not always acted on.

But, on the other hand, it is an error not to persist in some treatment for a sufficient time to accomplish the results desired: as stated, it may be necessary to change the actual prescription many times to suit the changing condition of the patient, and often even to suspend special treatment for a while in order to rightly meet certain conditions. But through it all one definite plan or purpose is to be carried out, until a cure is effected; and all this can be accomplished only by careful and persistent written records.

It is an error also, often shared by the patient, to suppose that when improvement has once begun, nature, in the way of a vacation, or even change of location and scene, will accomplish the rest. I often tell patients that it is better to do the right thing in the wrong place than the wrong thing in the right place; and I continually see more benefit resulting from the faithful carrying out of all needful treatment at home than from going elsewhere, even to the best locality, while using inefficient treatment, not rightly guided from time to time.

This error is constantly occurring in regard to the treatment of *syphilis,* and, as I said in my lecture last week, there is a great responsibility resting on physicians who at any time have charge of patients with this disease; for syphilitics so commonly imagine that as long as there are no external manifestations of the malady there is no need of faithful and continued treatment for the period which experience has demonstrated is necessary to overcome the poison and its effects.

Many times an error is committed in regard to patients with *syphilis* who go for what is too often wrongly spoken of as a "cure" at Hot Springs and other health resorts. It can be readily understood that no course of treatment, however active, for from three to six weeks can ever cure this

disease. I have seen many lamentable cases of the later ravages of syphilis in patients who have been so deluded.

Much the same error often happens in connection with patients suffering from diseases of the skin. They continually wander unsuccessfully from one mineral spring to another, the same or different seasons, on the advice of physicians and friends; and they thus not only lose much time which might have been devoted to successful treatment, but expending large sums of money in vain they become skeptical as to the possibility of cure, and are thereafter even less inclined to follow out any careful and well-directed plan of treatment which would eventuate in a cure.

It is an error, which is very deeply seated in the professional and lay mind, that arsenic is "good for diseases of the skin," and, as I mentioned in my last lecture, it is relatively rare for one who sees much of diseases of the skin to find patients with cutaneous maladies of any duration who have not been thus treated, and commonly with arsenic alone, to the utter neglect of all other internal or constitutional therapeutics; and, I may add, those patients are often found to be in a deplorable state in regard to their diet and hygiene, and the action of their emunctories.

Somewhat the same error frequently occurs regarding the use of iodide of potassium, which perhaps is given in the possibility that the lesions are syphilitic, in the absence of an accurate diagnosis. On the other hand, errors constantly occur when the latter element is not definitely recognized and efficiently treated as specific, as has been already mentioned and illustrated.

An error is also often made in overlooking a malarial element, and many a time an otherwise rebellious eruption will yield when this is thoroughly overcome.

We see, then, that a proper diagnosis in diseases of the skin often consists in more than simply giving a correct name to the lesions which are on the surface; indeed, it is quite as frequently the patient that is to be diagnosed, for as we have seen the cutaneous lesions may sometimes be the least important of all the symptoms presented.

On the other hand, it is quite as essential to recognize and properly treat as local eruptions those that are really such, although with some of them a certain amount of general care and treatment is essential in order to get the best results.

We will now briefly consider some of the errors which are liable to occur in connection with *local treatment.*

First let me remark that it is an error to expect too much from local treatment alone in every manifestation of disease on the skin, and also to expect immediate results in many cases; with the best treatment yet known many lesions are chronic—that is, slow in yielding—and they certainly do not yield unless the application is wholly suitable to the condition present.

Next I would say that it is an error to suppose that the patient, without proper instructions, understands anything about the correct method of using the external remedies, which may be ever so well prescribed. I have so frequently dwelt on this that I must not enlarge upon it now. Many a good remedy fails of its beneficial effect from a wrong method of using, and, as I showed so strongly in my lectures last year, the mode of making applications and removing them has much to do with their success; and the patient is very likely to err in these respects, and also in the use, or abuse, of water, unless properly instructed.

A common error connected with the local treatment of diseases of the skin is the one unconsciously committed by physicians of being unduly influenced by advertisements concerning remedies which are adroitly introduced by various firms for mercantile profit. As we all know, they claim at first to be offered only to the profession, and are accompanied by printed statements making wild claims in regard to their wonderful efficacy, attested to by persons signing themselves as doctors, but generally from remote districts, and quite unknown—and possibly non-existent. I can readily understand how even a good physician, puzzled

by the obstinacy of a case, when he has thrust upon him through the mail or by skilful agents one of these much-vaunted remedies, will think it worth trying, or, rather, may try it in a case without much thinking. The last of these proprietary local remedies has been introduced and pushed in quite another method, by appealing at once to the general public, often through clever reading notices or advertisements, even on the front page of the daily press, which does not affect its relative worthlessness.

Now all these quack and semiquack applications may have their value occasionally in certain cases, for they all probably originated in some prescription written by a regular physician for some particular case for which it was suited, and which was perhaps greatly benefited thereby.

But, gentlemen, we all know that the best results of medical thinking and experience are freely given to the profession, and through them to the public; and how can it be possible that such marvelous remedies as are continually advertised should escape the knowledge and experience of those skilled in such diseases, and be so much better for every case than any which they can offer? Every one who stops to think agrees that they cannot, and yet again and again newly advertised remedies of all kinds are continually employed, even by physicians of high repute. I think the explanation is found, partly at least, in a want of proper thought, and in the blind hope that something new and valuable may have been discovered which is not yet known to the profession. And how continually both the physician and patient are doomed to disappointment, and one after another advertised remedy is discarded! But still the error is made, and I suppose will be made, for the Americans are of all peoples the most credulous, if only sufficiently bold assertions are made. Pardon this long tirade, but I so constantly see the evil effects resulting from preparations of all kinds which are impudently pushed by advertising firms, attempting to instruct the physicians in therapeutics, that I could not resist speaking very plainly.

Many errors occur in dermatological practice from the use of too strong applications, which prove stimulating and irritating when a soothing effect is desired. I discussed this so fully last year that I will not dwell on it now; but I only want to caution you again to deal very gently with the irritated and inflamed skin, beginning with the mildest measures, and increasing the strength of them as occasion requires. Zinc ointment, when made as I described in my last lecture, or a proper calamine and zinc lotion, seldom irritates, but it often proves inefficient after a while, and needs to be altered or strengthened in various ways, or supplanted by other measures: the former forms a good base for the addition of carbolic acid, salicylic acid, resorcin, ichthyol, tar, oil of cade, etc.

I cannot close this part of the lecture without mentioning to you a curious error which I recently met with in regard to the use of the solid rubber bandage, which you have frequently seen applied, often with marvelous results, in the clinic. The patient was a woman aged thirty-five, who was brought to my office by her physician with a subacute eczema of the lower legs. Along with other appropriate treatment I advised the use of the solid rubber bandage, and as usual gave very explicit directions in regard to its application and as to the method of treating the parts when the bandage was taken off at night. In a week or two they returned, claiming that the rubber bandages were not satisfactory as a treatment, and seeking for something else, the bandages being then on. On removing them I found that they had been applied *over the stockings,* as the first application directly upon the diseased surface was not thought to be pleasant. The stockings, of course, irritated the inflamed tissues, and when after they were removed I applied the bandages exactly right, all went well. I have so often demonstrated this method of treatment that I will not say more, except to caution you not to commit the error of neglecting their em-

ployment in proper cases, or of not following the exact method of procedure which I carefully detailed and demonstrated in my lectures of last year.

All of us know that errors are constantly occurring in connection with the use of *x*-rays in the treatment of diseases of the skin; but those who have watched the brilliant results obtained in many cases in this clinic during the past few years do not need to be told of their value when properly used in appropriate cases. This plan of treatment has almost passed its experimental stage, and is certainly a most valuable adjunct to our armamentarium, but it must always have its danger of burning in inexperienced hands, and no one can be too cautious in handling it. But it is an error to use it too exclusively or to expect that its range of usefulness will extend to very many affections.

Finally, I would like to mention the error of the local use of nitrate of silver as freely and recklessly as it has been employed in past years: many a slight *epithelioma* of the buccal cavity or on the face has been goaded into an active state, and increased until it became a very serious affair, solely by the free and repeated application of nitrate of silver, as I have often seen.

With your permission I will now recapitulate some of the points made in this and former lectures in a manner which I trust will be of service in impressing certain of them in your memory. I beg to call your attention to a series of "Don'ts in Dermatology." If I seem to speak rather dogmatically I trust that this will be pardoned, as I only want you to appreciate and remember some of the items which many of us have had to learn from hard experience.

DON'TS IN DERMATOLOGY.

1. Don't be too hasty in a positive diagnosis, certainly not from inspecting any single portion of an eruption; many a cutaneous disorder will present very different appearances in different localities.

2. Don't fail to examine each and every part affected, both for diagnostic and therapeutic purposes.

3. Don't forget that a patient may have several entirely distinct and different diseases of the skin at the same time, one of which may mask the other and confuse the diagnosis.

4. Don't neglect to get and keep a full written history of every case, recording symptoms at each visit, with the effect of remedies, and abbreviated copies of prescriptions given.

5. Don't fail to use a magnifying glass in observing and studying all lesions on the skin, however good the vision may be; it demonstrates details in eruptions which the naked eye overlooks.

6. Don't lose sight of the value of the microscope when there is any suspicion of a vegetable parasitic disease.

7. Don't forget that syphilis is a great imitator of many diseases of various organs, and that in most dermatological statistics it forms about one-tenth of all cases.

8. Don't fail to establish the fact clearly whether syphilis has or has not anything to do with the special case under consideration.

9. Don't exclude syphilis simply because of the absence of a venereal history, if the character of the eruption and sufficient history and other symptoms corroborate it.

10. Don't ignore the fact of the relative frequency of "syphilis in the innocent," and don't fail to search for the present or past point of entrance of the poison by means of an extra-genital chancre, when other explanation is absent.

11. Don't overlook marital infection or hereditary acquirement of syphilis, although the latter seems to be much less frequent than in years past.

12. Don't forget, in cases which are at all doubtful, to use the analytical method of diagnosis, noting down any and all eruptions which might look like the one under consideration, and then, by a process of exclusion, eliminate one after the other, until the one is found which answers all or most of the requirements.

13. Don't forget, while studying the eruption in order to establish a correct diagnosis, that the patient commonly requires to be studied also, to enable him to understand the proper basis for treatment.

14. Don't forget that to have a healthy skin the body must be healthy, and all its organs must perform their functions in a proper manner.

15. Don't forget that the urine affords an index as to how the metabolic processes are performed; also that while there may be no albumin, casts, or sugar found in it, its chemical constitution may be far from normal and indicate great metabolic errors which should be corrected.

16. Don't forget that diet and hygiene may play a very important part, as contributory causes at least, in many eruptions, and that when they are faulty treatment may be proportionately unsatisfactory.

17. Don't imagine that arsenic is a panacea for diseases of the skin; experience has shown that it has relatively little if any effect on most eruptions, although when combined with other proper treatment it does often aid in restoring vital tone to many portions of the body.

18. Don't simply give iodide of potassium when in doubt, or when a possible syphilitic nature of an eruption is suspected; if the eruption is due to syphilis it should be so diagnosticated and efficiently treated with mercury also, even to the end.

19. Don't fail in your duty to syphilitics, both in guarding against the infection of others and also in securing for them effective treatment, sufficiently prolonged, to guard them against the serious possibilities of neglected syphilis.

20. Don't attempt too much local treatment in any of the lesions of syphilis; if the disease itself is efficiently treated constitutionally, there is very little need of other than the simplest local measures.

21. Don't be too vigorous or active with local treatment in any disease of the skin, unless you are very well acquainted with the remedies employed and feel that you understand the skin of the patient well.

22. Don't forget that much distress, and often harm, is caused by too stimulating and irritating applications, and that the skin is a delicate organ, when the epidermis has been removed or profoundly altered by accident or disease.

23. Don't suppose that any of the nostrums advertised for commercial advantage can have virtues above the remedies known to the profession, and do not employ them, as is often done, simply as a ready-made article of hoped-for value; whatever is known to be of value should, of course, be used by the profession.

24. Don't try to have too many remedies or combinations of remedies: it is better to have a few tools which one knows how to handle well than to have a vast number with which one is poorly acquainted.

25. Don't use nitrate of silver too freely or too frequently on superficial sores: those of simple character can be often thus stimulated into an epithelioma of serious character.

There are many more practical points and errors in dermatological practice of which I would like to speak, did time permit. But these are enough to justify the remark of the late Sir Erasmus Wilson, in regard to eczema, which I would apply to the general treatment of diseases of the skin. It is as follows: "To be a successful practitioner in the treatment of eczema" (diseases of the skin) "a medical man must be an accomplished physician: to manage the local treatment he must be an able surgeon. . . . In a word, the highest and best qualities of medical art and science must be put in practice with foresight and discretion for the treatment of an eczema" (disease of the skin).

If I shall have aided any of you by these simple lectures, and by presenting these "don'ts" and "does" of dermatology, so that there shall be fewer errors and more success in the management of the cases of diseases of the skin which may come under your care, I shall be abundantly satisfied. Next week I hope to present some of the "Danger-signals from the Skin."

531 Madison Ave.

THE RELATION OF THE PRODUCTION OF A RISE OF TEMPERATURE TO THE ACTION OF THE HEART AND THE ARTERIAL TENSION.

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When a puncture is made into the corpus striatum we have a rise of temperature to 105.5° F., which continues above normal for a few days (dotted line, Fig. 1). When a bilateral puncture is made into the tuber cinereum we have a rise of temperature to 109.5° F. (continuous line, Fig. 1). In these punctures the rate of respiration is accelerated and the volume of air inspired increased. But we have shown that the increase of volume of oxygen inspired is not necessary to the rise, as a naphthylamin compound decreasing the amount of oxygen inhaled produces a rise of temperature to 108° F. by an action on these centers. The punctures also increase the rate of the heart-beat and cause a rise of arterial tension, which returns to normal in about an hour and a half (Fig. 2).

The question now arises, How much in the rise of temperature must be attributed to the heart and arterial tension? To estimate the effect of extreme and rapid changes in blood-pressure we employed nitrite of amyl and adrenalin—one a great vasodilator, the other a great vasoconstrictor. Nitrite of amyl lowers the arterial tension chiefly by a local action on the walls of the arterioles. In addition we tried digitalin and barium chloride. The effect of amyl nitrite on temperature was to slightly lower it, as Experiment 1 demonstrates.

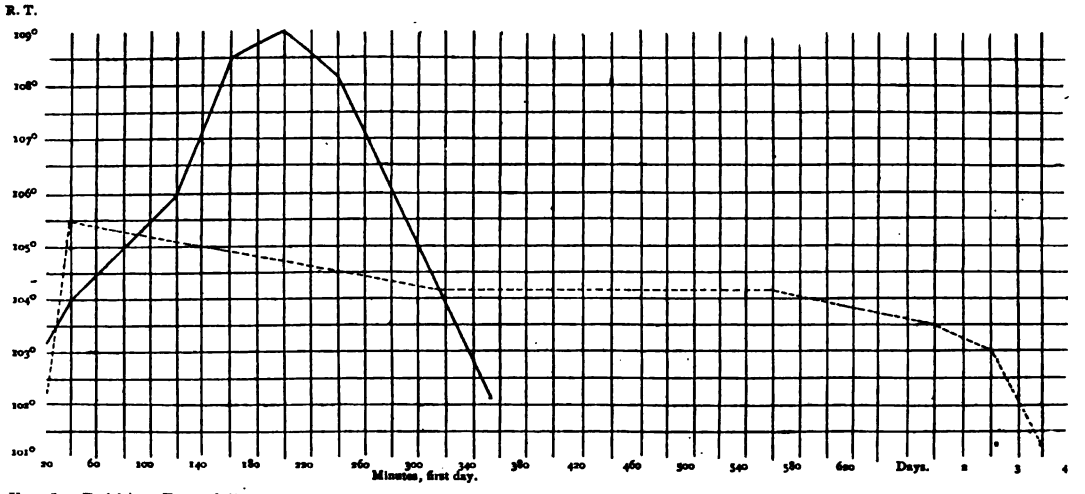

FIG. 1.—Rabbit. Dotted line represents rise of temperature from puncture of the corpus striatum. The continuous line is due to bilateral puncture of the tuber cinereum.

EXPERIMENT 1.

Inhalations of amyl nitrite; rabbit.

P.M.			
1.55	Temperature	104°	Inhalations.
2.00	"	104.2°	"
2.10	"	104.6°	"
2.20	"	104.4°	"
2.30	"	104.8°	"
2.40	"	104.4°	"
2.50	"	104.5°	"
3.00	"	104.6°	"
3.10	"	104.7°	"
3.20	"	104.6°	"
3.30	"	104.5°	"
3.40	"	103.7°	"
3.50	"	103.6°	"

Total amyl nitrite used, 6 m.
—.4° F.
All temperatures are rectal.

EXPERIMENT 2.

Inhalations of amyl nitrite; rabbit.

P.M.			
2.10	Temperature	103.6°	Inhalations.
2.20	"	103.6°	"
2.30	"	103.7°	"
2.40	"	103.8°	"

2.50	Temperature	103.9°	Inhalations.
3.00	"	103.8°	"
3.10	"	103.8°	"
3.20	"	103.5°	"
3.30	"	103.6°	"
3.40	"	103.5°	"
3.50	"	103.5°	"
4.00	"	103.5°	"

Total amyl nitrite used, 12 m.
—.1° F.

Now, this rise could not ensue from an action of adrenalin on the vasomotor center via the corpus striatum, as adrenalin elevates the tension when the vasomotor center is cut off, which I have often seen.

When a transverse section was made behind the tuber cinereum, then the temperature only rose about 0.6° F. This demonstrated that there was something in front of the section which caused the temperature to rise not 0.6° F. but 3.6° F.

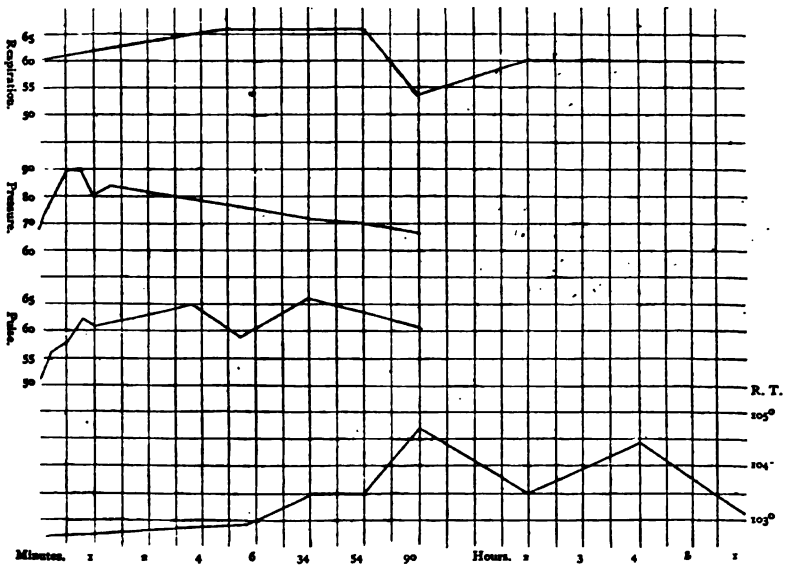

FIG. 2.—Puncture of tuber cinereum in rabbit from above.

EXPERIMENT 3.

Inhalations of amyl nitrite; white rabbit.

P.M.			
2.15	Temperature	104°	Inhalations.
2.25	"	104.5°	"
2.35	"	104.8°	"
2.45	"	104°	"
2.55	"	103.8°	"
3.05	"	103.6°	"
3.15	"	103.8°	"
3.25	"	103.8°	"
3.35	"	103.7°	"
3.45	"	103.6°	"
3.55	"	103.6°	"

Total amyl nitrite used, 12 m.
—.4° F.

Hence the lowering of blood-pressure is attended by a slight fall in temperature, due to an increased dissipation of heat from the dilated blood-vessels. A rise of temperature precedes the fall.

To increase the arterial tension we employed repeated injections of adrenalin, which produced salivation. The temperature rose to 106.6° F., as is shown in Experiment 4.

It is not due to increased supply of oxygen, as experiments with Gad's aeroplethysmograph demonstrated that the amount of oxygen inspired was diminished by adrenalin (Fig. 3).

EXPERIMENT 4.

White male rabbit; hypodermic injections of adrenalin chloride, 1:1000, P. D. & Co.

P.M.			
1.55	Temperature	103°	
2.00	"	103°	Injected 5 gtt.
2.10	"	103.2°	" 5 gtt.
2.20	"	103.8°	" 5 gtt.
2.30	"	104.8°	
2.40	"	105.3°	
2.50	"	105.4°	
3.00	"	105.6°	" 5 g.
3.10	"	106.2°	Salivated.
3.20	"	106.4°	
3.30	"	106.6°	
3.40	"	106.6°	
3.50	"	106.6°	

+3.6° F.

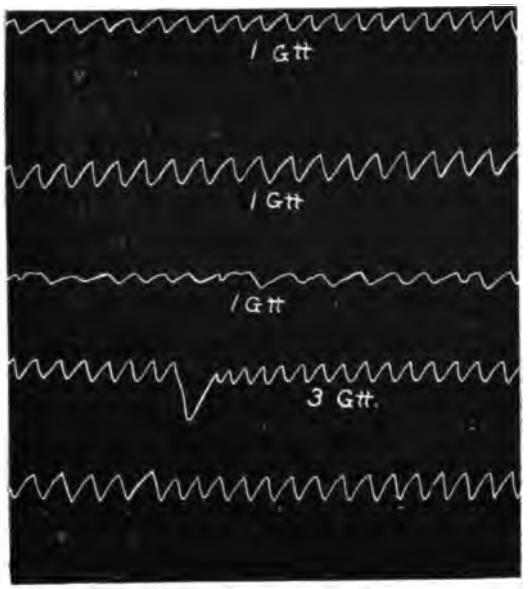

FIG. 3.—Action of adrenalin (per jugular) diminishing the volume of air inspired—lowest line normal. Tracing made with Gad's aeroplethysmograph.

EXPERIMENT 5.

Hypodermic injections of adrenalin chloride; white female rabbit.

P.M.				
1.25	Temperature	103.6°	Injected	5 gtt.
1.35	"	103.8°	"	5 gtt.
1.45	"	103.9°	"	5 gtt.
1.55	"	103.9°	"	5 gtt.
2.05	"	103.9°		
2.15	"	104.2°		
2.25	"	104.6°		
2.35	"	104.9°		
2.45	"	105.1°		
2.55	"	105.6°		
3.05	"	105.8°		
3.15	"	105.9°		
3.25	"	105.8°		
3.35	"	105.8°		

+2.2° F.

EXPERIMENT 6.

Section of brain, followed by hypodermic injections of adrenalin chloride; rabbit etherized.

P.M.				
2.00	Section of brain.			
2.05	Temperature	102.6°	Injected	5 gtt.
2.10	"	102.5°	"	5 gtt.
2.20	"	102°	"	5 gtt.
2.30	"	101.6°	"	5 gtt.
2.40	"	101.4°		
2.50	"	101°		
3.00	"	100.5°		
3.10	"	100.4°		
3.20	"	100.4°		
3.30	"	100.3°	Died.	
3.35	"	100.1°		

Post-mortem: Section through both crura cerebri.

—2.5° F.

EXPERIMENT 7.

Section of brain, followed by hypodermic injections of adrenalin chloride; white rabbit, etherized.

P.M.				
1.55	Section.			
2.00	Temperature	100.6°	Injected	5 gtt.
2.05	"	100°	"	5 gtt.
2.15	"	100°	"	5 gtt.
2.25	"	100.4°	"	5 gtt.
2.35	"	100.5°		
2.45	"	100.8°		
2.55	"	101°		
3.05	"	101.2°	Died.	
3.10	"	101°		

Post-mortem note: Section through crura cerebri, a few fibers undivided.

+.4° F.

EXPERIMENT 8.

Section of brain, followed by hypodermic injections of adrenalin; white male rabbit, etherized.

P.M.				
2.10	Section of brain.			
2.25	Temperature	103.7°	Injected	5 gtt.
2.35	"	102.8°	"	5 gtt.
2.45	"	103.6°	"	5 gtt.
2.55	"	103.7°	"	5 gtt.
3.00	"	103.7°		
3.05	"	103.7°		
3.10	"	103.7°		
3.15	"	103.7°	Died.	

Post-mortem: Section through crura cerebri.

EXPERIMENT 9.

Section of brain, followed by hypodermic injections of adrenalin chloride; rabbit lying on abdomen and etherized.

P.M.				
2.35	Section.			
2.40	Temperature	103.3°	Injected	5 gtt.
2.45	"	103.3°		
2.50	"	103.4°	"	5 gtt.
2.55	"	103.3°	"	5 gtt.
3.00	"	103.3°		
3.05	"	103.2°	"	5 gtt.
3.15	"	103.2°		
3.25	"	103.3°		
3.35	"	103.4°		
3.45	"	103.9°	Struggling.	

Post-mortem: Everything divided anterior to corpora quadrigemina except a few fibers in left crus.

+.6° F.

Hence neither the vasomotor changes nor the diminished supply of oxygen can account for the rise of temperature. We are driven to the conclusion that adrenalin stimulates the thermogenic centers in the corpus striatum and tuber cinereum, and this increases the temperature.

Tetra-hydro-beta-naphthylamin. — This drug greatly increases the temperature, producing a rise sometimes to 108.2°

(Experiment 12). Now this drug has been shown to lower the arterial tension and to slow the heart. It does not do this by an action via the corpus striatum, for the same result ensues when a transverse section is made behind the tuber cinereum (Fig. 4). Further lowering the tension, as shown by nitrite of amyl, lowers the temperature. Hence the great increase of temperature by this drug is due to a stimulation of the thermogenic centers, for when they are cut off hardly any rise ensues (Experiment 13).

EXPERIMENT 10.

Hypodermic injections of hydro-tetra-beta-naphthylamin; rabbit.

P.M.		
1.20	Temperature 103.6°	Injected .01 Gm.
1.30	" 103.9°	" .01 Gm.
1.40	" 104.2°	
1.50	" 104.6°	
2.00	" 104.9°	
2.10	" 105.2°	
2.20	" 105.5	
2.30	" 105.8°	
2.40	" 106°	
2.50	" 106.2	
3.00	" 106.4°	
3.10	" 106.4°	
3.20	" 106.4°	
3.30	" 106.2°	

+2.6° F.

EXPERIMENT 11.

Hypodermic injections of hydro-tetra-beta-naphthylamin; white female rabbit.

P.M.		
1.20	Temperature 103.6°	Injected .01 Gm.
1.30	" 103.9°	" .01 Gm.
1.40	" 104.2°	
1.50	" 104.6°	
2.00	" 104.9°	
2.10	" 105.2°	
2.20	" 105.5	
2.30	" 105.8°	
2.40	" 106°	
2.50	" 106.2	
3.00	" 106.4°	
3.10	" 106.4°	
3.20	" 106.4°	
3.30	" 106.2°	

+2.6° F.

EXPERIMENT 12.

Action of tetra-hydro-beta-naphthylamin; white male rabbit.

P.M.	Temperature.	
2.10	102.5°	Injected .01 Gm. per jugular.
2.20	102.8°	
2.25	102.9°	
2.30	103.1°	Injected .005 Gm.
2.40	103.5°	
2.45	103.8°	

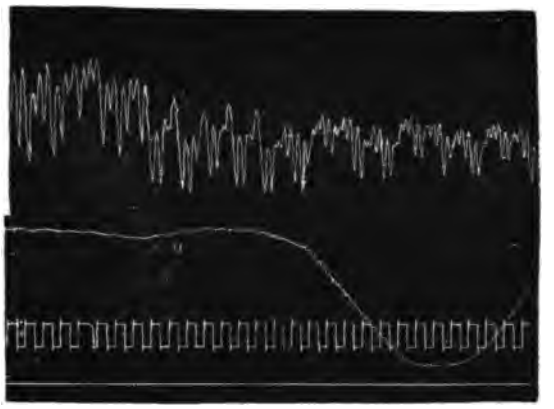

FIG. 4.—Highest line shows the primary action of tetra-hydro-beta-naphthylamin on the heart. Second line from the top shows the secondary action—a lowering of blood-pressure and rapid action of the heart (drug given per jugular).

P.M.	Temperature.	
2.50	104.2°	
2.55	104.5°	
3.00	105°	
3.05	105.2°	
3.20	105.8°	
3.30	106°	
3.35	106.2°	Injected .005 Gm.
3.45	106.5°	
3.50	107°	
3.55	107.3°	
4.00	107.5°	
4.15	107.7°	
4.20	107.8°	
4.25	107.9°	
4.30	108°	
4.35	108.2°	Rabbit dead.

+5.7° F.

EXPERIMENT 13.

Injections of tetra-hydro-beta-naphthylamin; rabbit.

P.M.		
2.55	Transverse section of brain behind the tuber cinereum.	
	Temp.	
3.00	103.3°	.005 Gm. per jugular.
3.10	103.3°	.005 Gm. per jugular.
3.20	103.5°	.005 Gm. per jugular.
3.25	103.5°	.005 Gm. per jugular.
3.30	103.6°	
3.35	103.7°	
3.40	103.8°	.005 Gm. per jugular.
3.50	104°	.005 Gm. per jugular.
3.55	104°	
4.00	104°	
4.05	104°	.005 Gm. per jugular.
4.15	104°	
4.30	104°	.005 Gm. per jugular.
4.40	104°	.005 Gm. per jugular.
4.45	104°	

+.7° F.

Irritation of a Sciatic Nerve.—We irritated the central end of the cut sciatic for half a minute at intervals of five minutes.

The blood-pressure is elevated by this procedure, but the rise of temperature was only 1.8° F.

EXPERIMENT 14.

Irritation of sciatic nerve; white rabbit.

P.M.			
2.00	Temperature	101°	Irritation.
2.10	"	101.2°	"
2.20	"	101.4°	"
2.30	"	101.6°	"
2.40	"	101.8°	"
2.50	"	102°	"
3.00	"	102.1°	"
3.10	"	102.1°	"
3.20	"	102.2°	"
3.30	"	102.3°	"
3.40	"	102.4°	"
3.50	"	102.6°	"
4.00	"	102.8°	"

+1.8° F.

Digitalin.—This increased the temperature 1.4° F.

EXPERIMENT 15.

Hypodermic injections of digitalin; white rabbit.

P.M.	Temp.	
2.20	101°	Injected 1/200 gr.
2.30	101°	Heart-beat, 185; respiration, 72.
2.40	101°	
2.50	101°	Heart-beat, 182; respiration, 70.
3.00	101°	Injected 1/200 gr.
3.10	101.2°	
3.20	101.4°	
3.30	101.5°	Heart-beat, 180; respiration, 60.
3.40	101.6°	
3.50	101.7°	
4.00	101.8°	Heart-beat, 185; respiration, 65.
4.10	102.°	
4.20	102.2°	
4.30	102.4°	
4.40	102.4°	Heart-beat, 180; respiration, 60.

+1.4° F.

Barium Chloride.—This agent also increases blood-pressure. The rise in temperature was only .2° F.

EXPERIMENT 16.

Hypodermic injection of barium chloride.

P.M.			
2.20	Temperature	103.8°	Injected 1/40 gr.
2.30	"	103.8°	
2.40	"	103.8°	
2.50	"	103.8°	
3.00	"	103.9°	
3.10	"	103.9°	
3.20	"	103.9°	
3.30	"	104°	
3.40	"	104°	
3.50	"	104.1°	
4.00	"	104.1°	
4.10	"	104°	
4.20	"	104°	

+.2° F.

All these experiments demonstrate that vasomotor variations of arterial tension cannot elevate the temperature beyond a rise of 1.8° F., nor depress the temperature below .6° F. The increased supply of oxygen in the puncture experiment is not necessary to the rise of temperature, as has been shown by experiments with tetra-hydro-beta-naphthylamin, which produces an enormous rise of temperature and at the same time reduces the supply of oxygen. We are driven to the conclusion that when the tuber is punctured and a rise of temperature to 109.5° F. ensues in three hours, it must be due to an excitation of the tuber which is connected with the trophic centers in the anterior horns of the spinal cord, and thus increases the

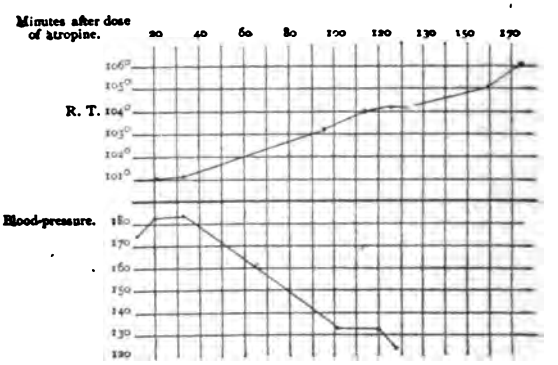

FIG. 5.

temperature. With a dental drill, guarded by a cross-bar, I have several times penetrated the roof of the mouth in the rabbit and irritated the tuber cinereum. The animal fell dead at my feet. A thermometer inserted showed within five minutes a rise of temperature to 110° F. Here there is a veritable explosion of heat production. Neither circulatory nor respiratory variations can account for it, as they have been suddenly arrested.

Because a thermal nerve cannot be demonstrated is no argument against thermogenic centers, for no one can demonstrate a sudorific nerve in the sciatic.

Punctures of the thermogenic centers produce a rise of temperature by increasing the production of heat and not by diminution of heat dissipation.

EDITORIAL.

THE VALUE OF SPINAL ANESTHESIA.

In the Original columns of the THERAPEUTIC GAZETTE more than one article has appeared recently in which excellent results have followed the employment of lumbar puncture and the injection of a local anesthetic in place of ether, chloroform, or chloride of ethyl by inhalation for the purpose of relieving pain when performing a surgical operation. Our own feeling in regard to this interesting procedure has always been that it must have a very limited range of usefulness, and that the surgeon should regard it as one of the things which can be done in cases which are so hedged about with difficulties that ordinary anesthetic procedures cannot be resorted to. Many years ago we heard a celebrated lecturer upon drugs assert that at some future time an anesthetic which could be taken by inhalation, as ether and chloroform are taken, would ultimately be invented which would relieve pain without destroying consciousness, and he spoke of this as a much-to-be-desired result. Increasing experience, however, has taught us that one of the most beneficent effects of ether and chloroform is the fact that they produce unconsciousness, for there can be no doubt whatever that where unconsciousness is not produced during the performance of an operation the dread and mental misery of the patient are not only distressing but materially aid in the production of surgical shock. This same objection holds in regard to the employment of spinal anesthesia, and we have repeatedly seen it tried in cases of severe cardiac disease with the result that the patient not only became frightened but cyanotic, and when a general anesthetic was administered to remove consciousness as a factor in the case, the condition of the circulatory system at once improved.

Our attention is called to this matter once more not only by the articles which we have named, but also by a very valuable summary of this subject which is contributed by Clark to *Progressive Medicine* for June, 1907. He calls attention to an article by Baisch, who has used this method of spinal injection in a large number of gynecological cases, and who points out that the area operated upon is one which makes spinal anesthesia particularly suitable. Indeed, theoretically, spinal anesthesia should become the sovereign method of anesthesia in gynecology. As Clark points out, however, from a practical standpoint, there seems to be little general disposition on the part of the gynecologist to resort to this method, not only for the reasons which we have already given, but also because female patients are as a rule favorable subjects for inhalation narcosis in that they are not accustomed to the use of alcohol and are not so frequently sufferers from myocarditis and cardiac dilatation. In gynecology it has been found that in severe radical operations, as, for example, for carcinoma uteri, where the procedure must last for an hour or longer, the maintenance of consciousness is decidedly disadvantageous, and the placing of a patient in the Trendelenburg posture when consciousness is preserved is not only cruel but almost impossible for so long a period.

The occurrence of headache and vomiting after spinal anesthesia have been urged as distinct disadvantages, equal to those following the older forms of inhalation narcosis, but Baisch asserts that these accidents have been due entirely to excessive doses. On the other hand, other observers have concluded that these disagreeable symptoms are quite as frequent even when the dose is carefully guarded and very small. It would seem probable, too, that the best results are obtained if at the same time the lumbar puncture is performed the patient also receives a hypodermic injection of scopolamine and morphine.

Some of the measures which are re-

sorted to by those who employ spinal anesthesia are so cumbersome and remarkable that American surgeons will scarcely be inclined to follow them, and that the method sometimes fails to some degree is proved by the fact that many of the continental practitioners are in the habit of administering a few whiffs of ether or chloroform toward the close of the operation to make the condition of the patient more bearable. The application of mufflers over the ears to prevent the patient being annoyed by sounds in the operating-room and the employment of blinders to restrict vision, either entirely or so far as the field of operation is concerned, requires the use of so much paraphernalia as to materially increase the mental shock of the patient. We venture to say that there are few physicians who, if they had to submit themselves to operation, would be content not only with the maintenance of complete consciousness but to have all connection with the outside world cut off by blinders and ear-tabs, resigning themselves to any procedure which the surgeon might think advisable at the moment.

IS TOBACCO SMOKE POSSESSED OF ANTISEPTIC PROPERTIES?

There is a very prevalent idea in existence among the laity, and to some extent in the minds of members of the medical profession, that the smoking of tobacco, during or after exposure to those infectious diseases which find their entrance into the body through the respiratory passages, distinctly diminishes the chance of infection. We therefore have read with a great deal of interest an article which has been published in the London *Lancet* of May 4, 1907, by Dr. Arnold, of Manchester, England, who has carried out a research with the object of reaching some conclusion in regard to this matter. Arnold points out that a bactericidal power in tobacco smoking is supposed to exist by many practitioners. He therefore carried out a series of investigations to determine whether the smoke of tobacco had any more protective influence than some of the other forms of dried vegetable matter which did not contain toxic organic bodies, and he selected ordinary hay as a control for his experiments. He found that the smoke of both hay and tobacco possessed distinct bactericidal power. The organisms tested were the bacillus of diphtheria, typhoid fever, the colon bacillus, and also the staphylococcus pyogenes aureus, and on one occasion the streptococcus isolated from the blood of a case of scarlet fever. All of the experiments with the exception of those upon the streptococcus were repeated five times, and different grades of tobacco were employed, from cheap navy cut to one of the more expensive mixtures. No difference in the activity of these various grades of tobacco was noticeable. About one-twelfth of an ounce of tobacco was used in each experiment, and the exposure lasted for five minutes. He found that the bacillus of diphtheria was always markedly affected. Sometimes it failed to grow at all after the exposure to tobacco smoke, and sometimes there was a slight growth. This occurred when this bacillus was exposed to either the smoke of tobacco or hay. On the typhoid bacillus the smoke from hay seemed to exercise more effect than the smoke from tobacco. The same fact held true to some extent with the colon bacillus. The staphylococcus was scarcely affected by tobacco smoke and but slowly affected by hay smoke. Curiously enough the streptococcus seemed to be completely destroyed.

Arnold therefore believes that tobacco smoke drawn into the mouth is very probably detrimental to the growth of some pathogenic organisms, but not more than the smoke from other sources, and he quotes a research made by Tessinari, who reached similar conclusions after passing tobacco smoke over cultures of various pathogenic germs, such as those of Asiatic cholera and pneumonia. This investigator also found that tobacco smoke passed through water killed the "yellow bacillus." Trillat believes that the antiseptic influence of the smoke depends upon the presence of formaldehyde, since he found that 100 grammes of tobacco yielded 0.063 gramme

of formaldehyde, and that some cigars gave as much as 0.118 gramme in 100 grammes of tobacco.

This research of Arnold's is, we think, of very considerable interest to those practitioners who are in the habit of commonly using "the much-abused weed," but the author is evidently afraid that he may be attacked by the antitobacco party, for he somewhat quaintly observes that while he believes that tobacco smoke is detrimental to the growth of germs he desires to make it clear that he states this fact as an observation and not as an argument in favor of the use of tobacco.

THE ENTRANCE OF AIR INTO THE VEINS.

Readers of the THERAPEUTIC GAZETTE will remember that from time to time we have published in these columns facts which have been developed in regard to the effect which is produced by the entrance of air into the veins. For many years it was universally taught by teachers of surgery that air embolism is an exceedingly fatal accident, and it was not until about twenty years ago, when investigations were published by Dr. Senn and the writer, that any serious doubt was thrown upon the actual danger of such an accident. At that time both Senn and the writer proved conclusively that the introduction of large quantities of air into the veins of animals comparatively rarely produced fatal results. Our attention is called to this matter once more by a communication to the London *Lancet* of May 4, 1907, by Dr. Whiteford, of Plymouth, England, who asserts that he has repeatedly noticed the entrance of air into a vein during operations on the neck without the slightest ill effect on the patient, and has also seen air bubbles injected with saline solution during intravenous injection without any evil effects, a fact which we ourselves have repeatedly noticed. As Whiteford points out, the mere development of a hissing noise may be due to the passage of air to strands of muscle and not to the actual entrance of air into a vein. We think that there can be no doubt of the fact that the entrance of very large quantities of air into the vein of a human being may produce death, and Delore and Duteil hold that when death occurs it does not arise simply from obstruction in the pulmonary capillaries, but from distention on the right side of the heart, and so they suggest aspiratory puncture of the right ventricle, which they assert is without risk. Whiteford also advocates the passage of a fine trocar and cannula into the heart cavity, and further suggests, if an ordinary aspirator is not at hand, that a cannula, attached to a piece of rubber tubing, be pushed into the ventricle and direct suction made by the mouth of the operator associated with the performance of artificial respiration. This rather heroic measure may be necessary in desperate cases, but it would seem that the remedy is almost worse than the condition which it is designed to relieve.

THE USE OF ATROPINE AND STRYCHNINE IN THE TREATMENT OF THE MORPHINE HABIT.

Those readers of the THERAPEUTIC GAZETTE who have been accustomed to peruse its pages for a number of years will doubtless remember that on several occasions interesting articles have appeared in its columns in which the treatment of the morphine habit by the use of hyoscine has been described. Within the last few months a number of papers have appeared in English journals in which in place of hyoscine a method has been described in which atropine and strychnine are employed. It is claimed by the employment of these two drugs that the patient can be rapidly deprived of his morphine or it can be stopped immediately after he comes under careful observation and restraint. It seems to us that in the majority of instances strychnine is unnecessary, since it would tend to produce a condition of nervous irritability in a person who was deprived of a sedative such as morphine, because in our experience the evidences of circulatory failure are rarely sufficiently marked to require its use. Then, too, it

would seem probable that the method of employing hyoscine in large doses is more rational than the English method of employing atropine, for while the two drugs are very nearly related, their physiological action is distinctly different, both in kind and degree, the hyoscine being infinitely more sedative than the atropine, which, when given in full doses, may in some instances, as is well known, produce a very active, talkative delirium which may be almost maniacal in its character. Neither drug is especially poisonous so far as the lethal influence of the remedy is concerned, and so it cannot be said that one drug is preferable to the other in regard to safety. Certainly, the soporific effects which are exercised by hyoscine in these cases are very distinctly advantageous, and furthermore hyoscine does not, when given in large doses, produce the great dryness of the mouth and the arrest of the other secretions which is so characteristic of the full physiological action of atropine.

THE VALUE OF SALINE INFUSION IN CHLOROFORM NARCOSIS.

Many years ago it was proved conclusively that chloroform is primarily and constantly a depressant to the vasomotor system, and, except for a very slight rise of arterial pressure which develops when it is first administered, which is due to nervous excitement rather than to the action of the drug, it produces a persistent fall of arterial pressure which is in direct ratio with the quantity of the drug inhaled. It has also been proved that this effect is largely due to depression of the vasomotor center; that the respiratory center is also depressed by the drug; and if chloroform is taken too freely, or administered in too concentrated a form, it acts as a direct depressant to the cardiac muscle. In view of the fact that many of the grave accidents which ensue during surgical operations are due to vasomotor palsy, it is manifest that chloroform, while it may be exceedingly useful in some cases, should not, except under certain circumstances, be employed in all cases for the purpose of developing surgical anesthesia. We think it has been pretty well decided by experimental research and by practical experience that the administration of atropine prior to the use of chloroform very distinctly increases the safety of the patient by its stimulant influence upon the vasomotor nerves, but we do not think that the simultaneous administration of morphine possesses similar advantages. So, too, there can be little doubt that the use of strychnine, simultaneously with the use of chloroform, increases the safety of the patient. Whether it is capable of doing good after the chloroform has produced its depressant influence upon the vasomotor center is open to question.

In *La Presse Médicale* of June 1, 1907, there is an article by Romme in which is discussed the value of saline infusion in chloroform narcosis, and in which he quotes the results which have been obtained by Burkhardt in the Surgical Clinic and Pharmacological Institute at Würzburg. Burkhardt thinks that not infrequently chloroform tends to produce a certain degree of albuminuria, and that the administration of a normal salt solution by infusion under the skin, or into a vein, diminishes the chance of renal irritation by increasing the flow of urine, and also that it distinctly augments the tolerance of the patient to the drug. Thus, he found that while death occurred in an animal seventeen minutes after the inhalation of 16 cubic centimeters of chloroform, a similar animal which had been transfused with normal saline did not succumb when 30 cubic centimeters of chloroform were given over a period of thirty minutes. Burkhardt believes with Tissot that the danger of chloroform narcosis depends largely upon the fall of arterial pressure which it produces, and that the infusion of normal salt solution actively combats this tendency to a lowered tension. As a result of his experiments upon animals he is now in the habit of administering, a quarter to a half-hour before the operation, an intravenous injection of from a pint to a quart of 0.7-per-cent solution of sodium chloride. Never, after such an infusion, has he met with an accident. The

temperature of the patient is maintained, the pulse is good throughout the period of operation, and postanesthetic accidents or disagreeable symptoms, such as headache, nausea, and vomiting, are never met with.

While we have no doubt that this method is distinctly valuable and that it is of use for flushing the kidneys and for maintaining the patient's strength, we doubt very much whether it materially modifies arterial tension, since it is well known that many pints of normal salt solution can be injected into the blood-vessels without raising pressure, the vessels dilating as fast as the fluid runs in. On the other hand, it is possible, if a carefully prepared saline infusion is employed which contains calcium chloride and other substances which are stimulating to the heart muscle and the muscles of the blood-vessels, for the solution to exercise a distinct stimulant effect. In other words, we reiterate what we have so often asserted in these pages, namely, that Locke's modification of Ringer's formula should be employed. There is no reason why this should not be used in view of the fact that these salts are now placed on the market in tablet form so that the solution can be readily prepared; or, better still, a concentrated sterile saline solution is found on the market of such a strength that one ounce of it when added to a quart of pure water makes a saline solution which possesses all the advantages which we have named.

POSTOPERATIVE TREATMENT.

Gibbon (*Annals of Surgery*, August, 1907) admirably epitomizes the tendency of the present day, which is not only toward a neat, expeditious, and complete operative procedure, with major consideration for the restoration of the patient to complete health and bodily activity, but also keeps clearly in view such questions as judicious preparation, careful selection of the anesthetic and the anesthetist, and an after-treatment so planned as to minimize discomfort and suffering.

He mentions with condemnation a practice, now fortunately rare, of sacrificing the patient's interest to the convenience of the clinic, by keeping him under an anesthetic before the operator and assistants are ready to begin their work, and warns against unnecessary exposure of the body, or chilling, or wetting the patient's clothing with antiseptic solutions, or placing the patient in such position as may induce postoperative palsy.

As to the anesthetic, he strongly advises a choice in accordance with the patient's general condition, implying at times, when local infiltration is not applicable, the morphine, chloride of ethyl, scopolamine, and ether sequence. Morphine, chloride of ethyl, and ether is the usual sequence. He cautions against rough handling of tissues, ligation *en masse*, and sutures tied so tightly as to make undue tension. Morphine he uses habitually in operations, stating that he has never done an abdominal section without administering a hypodermic of this drug and atropine before the patient has recovered consciousness, nor has he ever observed in a single case a bad effect. He gives a single hypodermic of morphine ¼ grain, and atropine 1/150 grain, before anesthesia is started, or certainly before the patient regains consciousness. The patient passes from the sleep of the anesthetic, and gets comfortably over the most distressing hours after operation, when ether is being eliminated by the lungs in large quantities and nausea and vomiting are common.

The idea that morphine causes vomiting after operation is absurd. Indeed, finding the vomiting in the abdominal cases in which this plan was used much less than the cases in which it was not used, and the patient infinitely more comfortable and return to consciousness more quiet, Gibbon now gives the hypodermic after any operation of magnitude or long duration, or where he expects much after-pain. He prefers to give the drug before or during anesthesia. Thus the patient will not learn the comfort which comes from it. The pain which develops some hours after operation he does not consider should be treated by the administration of an anodyne. Here there is some cause in or about the wound

or the dressings which should be sought for and removed. The lessened nausea and vomiting after operations Gibbon attributes to improved methods of administering anesthetics, first, and secondly to the lessened quantity given—indeed, he states that by employing chloride of ethyl first the amount of ether administered to a patient is reduced nearly one-half. Inhalations of vinegar have seemed to him to be productive of some good in lessening postoperative vomiting, and at times a draught of water will have a distinctly sedative effect, as will a change of posture. Elevation, for instance, to the sitting position will relieve nausea. This is particularly true after operations on the stomach itself. Thirst, if it cannot be largely relieved by giving large quantities of salt solution by the rectum, is assuaged by the administration of water by the mouth, an ounce at a time. Liquid food is administered as soon as the patient desires it, or as soon as nausea has passed away. Any movement which does not directly interfere with the healing process of the wound should be allowed. A properly closed abdominal wound is in no way injured by placing the patient on his side. Indeed, a consistent effort should be made to secure for the patient the most comfortable posture.

In regard to postoperative catheterization, advice is given not to resort to this procedure unless the bladder is painfully distended, and since difficulty in micturition is often incident to decubitus Gibbon is inclined where this seems the causative factor to allow patients to get out of bed, unless the position or the extent of the operative wound absolutely contraindicates this. The intestines should be allowed to rest quietly after operation, and this especially holds in such cases as have been given adequate preoperative treatment—*i.e.*, in those whose bowels have been well cleared. On the third day a movement is secured by a glycerin suppository, or an oil or soap-suds enema.

As to the time at which the patient is allowed to get out of bed, this should be accomplished with old people at the earliest possible moment. In simple appendectomies, when the abdominal wound is closed and no muscle cut across the fibers, Gibbon gets his patient out of bed on the eighth or ninth day with the abdomen well supported by a binder, and allows moving about on the tenth or eleventh day. He advises careful consideration of the patient, since while there are many who are benefited by a long rest in bed, there are others, such as old people, and those who are inclined to magnify their ailments, made worse by confinement.

Gibbon also calls attention to the need of after-treatment, especially the hygienic, in order to completely restore to health the patient, or as nearly reach this end as lies within the power of the surgeon.

In commenting upon Gibbon's contribution, Deaver, who believes in straight ether anesthesia and the avoidance of medicine, holds that the administration of oxygen markedly lessens nausea and that a careful nurse is of more moment than a hypodermic of morphine. Deaver encourages his patients to get out of bed early; especially are cases of hysterectomy gotten out in a week and advised to turn on their side early. Deaver holds that thus the danger of phlebitis is greatly lessened. He always allows his patients to get up to pass urine in case this be needful, since worse results than are made possible by this come from catheter cystitis.

Rodman corroborates Gibson's observation regarding morphine, though he is not in favor of its administration as a routine measure. Cancer patients, he states, should be gotten out of bed in forty-eight hours, even when this involves the abdominal viscera. As to enterostomy for cancer of the stomach, the patient should be sitting up on the day following operation.

Harte accentuates the fact that early postoperative feeding is unquestionably a great error, as food introduced too soon only ferments and causes an immense amount of discomfort. As a rule patients are much better for waiting twenty-four to forty-eight hours. Even then, if there is a question of irritation of the stomach, nourishment can be furnished by the bowel.

Roberts holds that postoperative back-

ache is not due to the operation itself, but is usually caused by the flat operating table on which the patient lies during anesthesia and operation. He therefore has a hard pad on the table under the lumbar region of the patient, the table being made to fit the curves of the back so that the muscles and ligments may not be strained. For eighteen years he has given before almost all operations a quarter of a grain of morphine and one one-hundred-and-fiftieth of a grain of atropine hypodermically, nor has he found it to hurt the patient. He believes the curse of thirst should be avoided by all sensible surgeons, and strongly condemns the unnecessary torture thus induced, believing that water can do no harm.

The views thus expressed by Gibbon and his commentators represent, with minor and personal differences, those generally held by American surgeons. They are based on common sense and humanitarianism and are justified by experience. Their adoption has greatly extended the usefulness of the surgical field by robbing operation of its major terrors.

THE OPERATIVE INDICATION IN GASTRIC CARCINOMA.

In an elaborate article based on hundreds of cases, most of them original, Nyrop (*Archiv für klinische Chirurgie,* lxxxii, H. 4) proves again the now generally accepted dictum that symptoms of cancer of the stomach are simply those of pyloric obstruction, and that obstruction from any cause may be characterized by identical symptoms, with hydrochloric acid deficient and lactic acid present. Moreover, non-obstructive cancers are often symptomless.

Nyrop holds that operation is imperative when the remains of food are habitually found in the stomach twelve hours after eating, or when there is a palpable tumor. In all cases of chronic and persistent delayed digestion not cured by internal treatment the operation should at least be considered.

The diagnosis between ulcer and cancer is complicated by the frequency with which a cancer develops on an ulcerative base. The age incidence of cancer and ulcer corresponds closely (thirty to fifty-five years). Emaciation is an expression of lost motility or obstruction, and is dependent upon the position and extent of the lesion and not its nature. Even the long-standard test of hydrochloric acid is no more to be depended on, since this acid is absent in a number of gastrointestinal affections and is habitually subnormal in many healthy persons. Indeed, Seidelin found free acid constantly absent in 40 per cent of persons over fifty. Lactic acid is simply a sign of retention fermentation.

Hematemesis may occur in cancer, ulcer, or hepatic disease, or even with no demonstrable lesion. Coffee-ground vomit and palpable tumor have a certain diagnostic value, but they occur too late to be of practical service.

The only possible early diagnosis is that of obstruction. The nature of the obstruction must be determined by an operation.

Nyrop distinguishes between functional and organic obstruction, holding that symptomatically the two affections can be differentiated by a certain intermittence of symptoms in the former case. Nor are apparently functional or spasmodic cases so benign as to be relegated entirely to conservative treatment. They may complicate ulcer or cancer, or may in themselves induce a sphincteric hypertrophy leading to organic obstruction, dilatation, and atony of the stomach; or by interference with the blood supply, from pressure on the vessels, causing ulceration. Tetany may develop as a complication of a functional pyloric narrowing. In view of these dangers Nyrop does not hesitate to advise exploratory operation in every case of pyloric obstruction, whether it be due to pylorospasm or to valvular obstruction with or without associated gastroptosis, since the symptoms of these conditions are completely relieved by gastroenterostomy. The relatively favorable results of operation on pyloric cancer as compared with those of intervention for the relief of malignant infiltration of other parts of the stomach are attributed entirely by Nyrop to the fact that in the former case obstructive symptoms lead earlier to operation.

Nor could he cite a more striking instance of the symptomless course of non-obstructing gastric carcinoma than that of Mikulicz, who accidentally discovered his own cancer while palpating his abdomen, but not till it had attained a growth that made it inoperable.

Nyrop concludes his paper by urging a test for gastric retention in all stomach disturbances. The test he prefers is that of Bourget. The patient is given a meal of bread, meat, and eight to ten cooked plums at 8 P.M., and at 8 the next morning the stomach is carefully washed out. Unless there be gastric retention no food remains will be found in the washing.

For the determination of the effect of posture on retention the plum bread and meat breakfast is given at eight in the morning, the patient thereafter walking about and taking his meals as usual, but not plums. At eight in the evening the stomach is washed out, and if the remains of plums are found the diagnosis of obstruction is assured.

Nyrop's conclusions are in general accepted by those who have made the most careful medical and surgical study of gastric carcinoma. It remains to be proven, however, that his dictum to the effect that every one who has chronic stomach trouble should be given plums, and that if these plums or parts of them can be recovered by the tube in twelve hours section should be performed, is subject to so few exceptions as to make it a safe and wise working rule.

EXPERIMENTAL PARTIAL OCCLUSION OF ARTERIES.

A rapid occlusion of certain arteries—for instance, the carotid, renal, mesenteric, femoral, or aorta—so inevitably in some cases, or frequently in others, leads to disaster that the attention of the surgeon has long been directed to accomplishing a gradual closure by means of which opportunity might be given for the gradual establishment of a collateral circulation, as in the case of the carotid, the femoral, and the aorta.

With this end in view Halsted and Sowers have conducted a series of experiments upon dogs by which they illustrate that aluminum bands so applied as not to occlude the lumen of the vessels may remain in place on the arterial wall in the case of the aorta, femorals, carotids, and renals for months without causing macroscopic injury to the vessels. Such bands can be removed at any time, and probably without risk of subsequent dilatation of the arterial wall; or they may be tightened at a second operation and the lumen totally occluded.

Although the intima beneath the occluding band is drawn into folds longitudinally, adhesions between these folds have rarely been found. The vessel wall can be easily smoothed out and the full lumen reëstablished. When the bands have been rolled tightly enough to completely interrupt the circulation the vessel wall, inside the band, atrophies, but hemorrhage is invariably prevented by the formation of enveloping connective tissue. Complete thrombosis of the vessel wall when a partially constricting band has been applied is not observed.

Halsted and Sowers propose the application of such bands in place of ligature of the internal or common carotid. Occlusion may be produced gradually, and should cerebral symptoms develop the band may be removed. They believe that aneurism of the aorta may be treated by making a partial or progressive occlusion of the aorta above the aneurism; that the band is possibly safer than the ligature in calcareous areas; that in certain cases of rupture of diseased thoracic or abdominal aorta a metal band might be used to close the rent.

In five human beings these bands have been put on the common carotid on one side coincident with ligation of all or most of the branches of the external carotid on both sides, for starvation of inoperable malignant neoplasms involving the face and upper part of the neck and jaws.

Dr. Halsted has also successfully applied the band to the innominate artery in the treatment of subclavian aneurism.

In this relation it is interesting to note that Jordan (*Archiv für klinische Chirurgie*, Bd. lxxxiii, H. 1), working more crudely

along similar lines, proposes a forty-eight-hour preliminary occlusion of the carotid to test the effect of its ligation and excision. This procedure was suggested by the necessity of carotid resection arising in the course of an operation for recurring primary sarcoma of the neck. Under local anesthesia two days before his second operation Jordan exposed the carotid artery, wrapped it about with iodoform gauze, and then around this iodoform wrapping tied a ligature just tight enough to stop the temporal pulsation. This procedure being attended by no disturbance of any kind, he proceeded to his formal operation forty-eight hours later. First he removed this ligature and iodoform packing, whereupon pulsation was immediately restored to the temporal artery. The internal carotid, pneumogastric, and sympathetic nerves were resected. Nor did the patient afterward exhibit brain symptoms; he lived five months, later dying of symptoms which strongly suggested that the tumor originally diagnosed as primary in the neck was in reality secondary to a laryngeal growth.

Jordan's procedure has little to commend it, barring its principle, which is much better applied by the aluminum plates devised by Halsted and Sowers.

In so far as laboratory experiments are to be depended upon, the method of gradual occlusion promises to render inestimable service in some cases of vascular lesions which hitherto have been beyond surgical help.

REPORTS ON THERAPEUTIC PROGRESS.

FUMING INHALATIONS IN ASTHMA.

Folia Therapeutica, a new English journal, for April, 1907, contains an article by SAWYER in which he tells us that for many years he has prescribed the following fuming inhalation for many of his bronchially asthmatic patients, with remarkable therapeutic success:

℞ Potassii nitratis, ʒss;
Pulv. anisi fruct., ʒss;
Pulv. stramonii fol., ʒj.
M. ft. pulv.

As to the way of using it. A thimbleful of this powder placed upon an earthenware plate is pinched by the fingers into a pryamidal shape, and lighted at the top of the little conical heap. It burns with a smoldering and gently deflagrating flame, and is held near and beneath the patient's face, who breathes in the smoke as it issues from the burning heap of powder. The ingredients of the powder should be dry, well mixed, and finely powdered.

This method of treating the painful difficulty of respiration which arises in bronchial asthma is very marked in its good effects, in most of the cases in which it is properly employed. The inhalation of the pungent and soothing smoke of the burning powder appears to produce several good results, namely, it allays bronchial irritability and spasm, promotes copious and free expectoration, and gives relief, *tute, cito, et jucunde,* to the distressful dyspnea. Such therapeutic indications are important, and often imperative. In busy practice we are called upon often to give relief of this kind. For such help the patient presses urgently; want of breath is one of the most urgent of human needs; the patient's anguish—and no anguish is like unto it—is a mixed result of the physical and of the psychical, of his material necessity and of his mental alarm, of what he feels and of what he fears. As sound therapeutists we cannot expect the use of fuming inhalations in asthma to be much more than palliative, but this indeed is much. For fuller treatment of the disease and of the subject of it—that is to say, for the reduction of the frequency and of the severity of the asthmatic attacks, and for their abolition, if in a particular case it may be—many other resources of the physicians' art have

efficacy; for example, in the several directions of medicinal, dietetic, climatic, hygienic, respiratory, and gymnastic therapeutics. Of course, these must be variously selected and variously combined according to the idiosyncrasies of individual patients, as ascertained by competent examination and as determined by competent experience and skill. In asthma, as in all disease, each patient is a law unto himself, and he who can read that law the best is the sufferer's best physician.

As a variant of the powder, of which the writer has just given the formula, one may prescribe another containing lobelia, black tea, and oil of eucalyptus. Here is such a prescription:

℞ Potassii nitratis, ℥ss;
Pulveris stramonii fol., ℥j;
Pulveris anisi fruct., ℥ij;
Pulveris lobeliæ inflat., ℥j;
Pulveris fol. theæ sinensis nig., ℥j;
Ol. eucalypti, min. xv.
M. ft. pulv.

Or, when and where the pungent fumes of sulphur in combustion may be indicated:

℞ Potassii nitratis, ℥ss;
Sulphuris sublim., ℥ss;
Pulveris anisi fruct., ℥iijss;
Pulveris stramonii fol., ℥j.
M. ft. pulv.

Far away from a pharmacy one might wish to extemporize a reliable fuming inhalation. A mixture of one part by weight of saltpetre and two parts of black tea, powdered, makes a good asthma powder for burning for emergency use, and both these ingredients are usually to be found as household possessions.

The writer has devised two other variants of the fuming inhalation, of a milder kind than those already detailed in this paper, which will be found useful in the management of some of those catarrhal bronchitic cases which manifest dyspneal tendencies of the slighter kind. One is produced by making spills of blotting-paper and soaking them in the compound tincture of benzoin for a few minutes; these are set aside to dry. One of the dried ones should be lighted, the flame blown out in two or three seconds, and the incense-like smoke from the smoldering spill should be inhaled by the patient, the smoldering being kept up by sharply moving the spill to and fro. The other of these milder remedies is furnished by the fragrant smoke of burning Irish peat. A "brick" of this peat should be placed upon fire in a grate until it begins to smolder freely; then, taken up in tongs, it should be held a foot or so below the level of the patient's nostrils.

TREATMENT OF BURNS AND SCALDS.

MORAN states in the *Virginia Medical Monthly* of March 22, 1907, that the constitutional treatment of burns and scalds is directed to the relief of shock and the mitigation or abolition of pain. The former should be dealt with practically in the same manner as if it were occurring in any other injury; the latter is best relieved by the administration of the alkaloid morphine. This is a stimulant to the vital powers as well as being analgesic; but to get the good effect and quiet the suffering of the patient, one must use it rather freely.

The body temperature must be maintained by heat, alcoholic and hot drinks, stimulants, etc. If possible, where a tub is at hand, as in hospitals, place the patient in a bath at a temperature of 110° F. This refers to those cases with extensive involvement of surface and with great shock. The continuous warm bath, plain or medicated, is used with excellent results by many surgeons. Simple burns only require local treatment.

In applying local treatment to burns, one must be governed by the degree of burning. Burns of the first degree need very little treatment. Burns of the second and third degrees demand more vigorous measures for their healing than are required for the relief of a simple hyperemia. Here, in addition to medicaments the author urges as a precaution, when necessary, that means be provided to overcome deformity. Thus splints will hinder contraction, massage will prevent ankylosis, and skin-grafting will restore the parts to a more normal appearance. The last operation will transform a

chronic ulceration into healthy tissue and is often a life-saving procedure.

One should have due regard for asepsis and antisepsis in applying local treatment to burns, for the surgeon's fingers may be the carriers of infection, as prolonged suppuration sometimes proves. Vesicles should be punctured with a sterile needle and their contents allowed to escape. However, do not remove the epidermic covering; it serves as a protection to the underlying wound, excluding the air and guarding against infection. Irrigate the burned area with a weak antiseptic solution, or better, with normal salt solution. The latter is physiological in its action and does not destroy the cells of the parts. Indeed, some observers have found normal salt solution a valuable permanent dressing for burns.

When there is much destruction of tissue, remove all sloughs and putrefying masses and treat as the condition demands.

Excepting in severe, deep burns, one will perhaps obtain the best results from the use of oleaginous or wet dressings. A formula that has given good results in the author's hands is the following:

Carbolic acid, 1 per cent;
Balsam Peru, 5 per cent;
Castor oil, 94 per cent.

This mixture can be poured on gauze or cotton and applied to the wound. It should be renewed daily.

Solutions of bichloride of mercury, carbolic acid, and other poisonous drugs are mentioned to be condemned as dressings for burns on account of the irritation and pain which they occasion, especially when used on large surfaces, and also because they interfere with healing and seem to predispose to the formation of less smooth cicatrices. The author would not discourage, however, their service after the healing process is far advanced, and the parts have lost their sensitiveness.

Powders are only to be employed after the granulations have become practically aseptic and dry, and those official in the Pharmacopœia are as reliable as the more costly proprietary preparations.

Nutritive dressings have been recommended as valuable for sluggish granulating surfaces due to burns. Specially prepared meat juices are said to exert a wonderful influence upon the embryonal cells during the formation stage, but when the granulations become healthy they have served their purpose and must give place to other dressings.

THE TREATMENT OF ARTERIOSCLEROSIS.

SENATOR in *Folia Therapeutica* for April, 1907, says as to treatment that we must in the first place have regard to the cause, and endeavor to remove this by every means in our power. It is true we cannot impose a check upon the advancing years which lead to the senile form of the disease, but we can at any rate prevent the changes in the organs, and more particularly in the vessels, which gradually appear as age advances, retard them in their development, and see that they do not progress with undue rapidity—in a word, we can prevent the onset of *senectus præmatura.* Further measures are to be taken to keep at arm's length or remove completely all those injurious influences which in earlier life further the development of arteriosclerosis, and combat those diseases which act as the soil in which arteriosclerosis flourishes. The exogenic intoxications must be strenuously counteracted, and habits appertaining to alcohol and tobacco should either be forbidden or at any rate considerably restricted. In doing this, however, regard must be had to individual customs and conditions of life, as any sudden withdrawal or violent change is liable to be followed by bad consequences. Gradual methods of discipline are more to be recommended.'

Apart from luxuries, however, the ordinary diet requires regulation. Having regard to what has already been said on the subject of intestinal decomposition resulting from proteid food, it will be readily understood that this must be restricted as much as possible. Nitrogenous foods such as meat, particularly foods rich in extractives, and very rich foods—such as beefsteak, ham, sausage, cheese, and such like—are

best excluded from the diet altogether. The so-called lactovegetarian diet is to be recommended, in which carbohydrate and fat are the chief constituents, in which albumen is only present in quantities strictly necessary for maintenance, and in which so-called extractives and products of curing are absent altogether. The type of this diet is that of milk to which is added all kinds of carbohydrates, such as bread, farinaceous foods, gruel, fat, green vegetables. Eggs may be allowed in small quantity. Meat is not taken at all or only in small amount, and should be of the watery kinds poor in albumen (the so-called white meats). Fresh fish is allowable.

In the case of the obese, some modifications of the above diet must be made in order to limit as much as possible the formation of fat, and to this end carbohydrates such as sugar, farinaceous foods, and other starchy foods must be excluded from the diet. In these cases, therefore, green vegetables and fruit are desirable, while rather more lean meat is allowed, care being taken that the bowels remain freely open and that muscular exercise is obtained by means of movements and active and passive gymnastics. The latter must of course be carried out without overstrain and under constant supervision of the heart's action.

In the case of diabetics who are also the subjects of arteriosclerosis, certain difficulties present themselves owing to the fact that albumnious food plays a prominent part in the treatment of diabetes. In these cases, therefore, the albuminous articles of diet should not as a rule be restricted to the same extent as in the other subjects of arteriosclerosis, but on the other hand greater limitations must be imposed upon the carbohydrates, for with but few exceptions the reduction of the excretion of sugar still remains the leading indication for treatment.

It will generally be found necessary to go first on one tack and then on the other, according to the rate of sugar excretion, sometimes more and sometimes less proteid nourishment being allowed, and the urgent claims of green vegetables, sour fruit, salads, and particularly of fat, should not be lost sight of.

While the lactovegetarian diet does not fulfil all the requirements of the case, it has one very decided advantage. From recent investigations it appears that the viscosity of the blood is lowered by this and the purer forms of vegetable diet. This means that the onward movement of the blood is promoted, and the work of heart and blood-vessels, particularly of the arteries, is lightened. By this means much good may be done toward counteracting the disease of the vessels and preventing cardiac hypertrophy.

A similar action, viz., that of decreasing the viscosity of the blood, appears to be possessed by preparations of iodine, and upon this fact rests, not alone, but for the greater part, the favorable influence which undoubtedly is to be observed by the use of these preparations in arteriosclerosis. It is possible that they may besides exert some favorable action upon the arterial coats, especially upon the intima.

The favorable influence of iodine preparations upon the circulation may be rendered still more marked by combining them with drugs which dilate the arterioles and capillaries—*i.e.*, the arterial basin. Such substances are nitrite of amyl and other nitrites. A good formula is:

> Tinctura iodi, min. xv;
> Spiritus ætheris nitrosi, f℥j.

Twenty to thirty drops to be taken three or four times a day.

Or,

> Nitroglycerini, ♏min. viij;
> Spiritus ætheris nitrosi, f℥j.

Twenty drops to be taken three or four times a day.

A similar action, namely, dilatation of a considerable portion of the arterial basin, lowering of the blood-pressure, and thereby circulatory relief, can be obtained by means of various hydropathic procedures. Simple warm baths are effective, but where extensive arteriosclerosis exists, and particularly in cases in which the heart participates in the mischief, great care must be used, and it is therefore better to replace the simple

baths by carbonic acid or oxygen baths. Other hydrotherapeutic measures, such as water bandages, rubbings, baths, and douches in various combinations, may act favorably; these are not to be used as routine measures, but with a strict regard to the merits of the particular case and under careful supervision of the heart's action.

The same remarks apply to massage and active and passive gymnastics. It is here most particularly that one must proceed cautiously and with careful trial in order not to cause injury by overstepping the bounds of the patient's endurance.

THE CLINICAL SIGNIFICANCE OF DIGITALIS ARRHYTHMIA.

After observing a case of cardiac arrhythmia accompanying the use of digitalis and carefully analyzing the various theories advanced relative to the manner in which digitalis is supposed to produce this phenomenon, DURITRENKO (*Berliner klinische Wochenschrift,* Nos. 14 and 15, 1907) came to the conclusion that neither the protracted nor excessive use of the drug is capable of producing arrhythmia.

He believes that the arrhythmia depends upon certain conditions of the cardiac mechanism, which in turn are dependent upon certain transitory relations existing between various portions of the organism. For instance, in his own case, in which digitalis was used on three separate occasions, arrhythmia occurred at a time when there was great edema of the lower extremities, a condition which the author believes may have materially altered the relation between the peripheral and internal circulation.

He is of the opinion that the occurrence of a single extra systole during a course of digitalis treatment does not constitute an indication for the suspension of the drug. The drug must be stopped, however, as soon as any decided acceleration of the pulse manifests itself. Upon the occurrence of arrhythmia it must also be suspended until the patient's general condition becomes improved, when it may be begun again.

In severe cases of ruptured compensation the author believes that digitalis should not be administered until a preparatory treatment has been given, which will depend upon the physiological conditions present in the individual case.

NUTRITIONAL DISTURBANCES IN INFANCY DUE TO OVERFEEDING.

In an article in the *Journal of the American Medical Association* of April 20, 1907, BRENNEMANN concludes that:

1. Overfeeding is so prevalent in this country that it is the rule.

2. Overfeeding is second to no other factor in the pathogenesis of infant feding.

3. Overfeeding presents an easily recognizable, definite symptom-complex.

4. The percentage method is inadequate to prevent overfeeding, the well-known feeding "schedules for an average healthy infant" of a given age fostering it by recommending excessive amounts; and, moreover, mere percentage leaves undetermined the amount of food the baby gets.

5. To feed rationally and especially to prevent overfeeding it is necessary to know how much food the baby is getting in proportion to its body weight, best expressed in terms of energy quotient.

6. The disturbing element in overfeeding with cow's milk is the fat.

7. Fat in excessive amounts regularly produces constipation—proteids never do so.

8. It is never necessary to give more fat than proteids of cow's milk.

9. The interval between feedings should be four hours.

THE PROTECTIVE FUNCTION OF THE LIVER AGAINST TOXIC INTESTINAL SUBSTANCES.

PETRONE and PAGANO (*La Presse Médicale,* Feb. 13, 1907) conclude from the experiments which they conducted upon rabbits that the liver exerts an energetic protective action against toxic intestinal products, and that the views of certain investigators who believe that the intestinal wall itself is solely responsible for this de-

fense of organism against the poisonous substances are erroneous.

Their experiments were conducted differently from those which have previously been made. The materials employed were aqueous extracts of feces of children suffering with gastroenteritis. The animals employed were of the same sex, breed, and age, of the same color, and as near the same weight as it was possible to obtain them. All were subjected to laparotomy and the ligation of a mesenteric vein. In some the poison was injected through a mesenteric vein; in others through the auricular vein. Observations were made relative to the following conditions:

1. *General Condition after the Injection.*—It was found that those animals injected through the peripheral vein showed signs of profound weakness and refused food for two days. Moreover, they had a diarrhea which lasted from five to seven days.

Those injected through a mesenteric vein showed only transitory weakness, refused food for only half a day, and did not develop any diarrhea.

2. *Survival.*—Three of the eleven rabbits injected through the auricular vein died at the end of three days, forty-two hours, and twenty-two hours respectively. The remaining eight did not succumb.

None of the eleven injected through the mesenteric vein died.

3. *Weight.*—The rabbits injected through the auricular vein lost, on an average, 107 grammes the first day and 65 grammes the second day. The loss continued until the sixth day.

Those injected through the mesenteric vein lost, on an average, 37 grammes the first day and 18 grammes the second day. On the following days their weight progressively increased.

4. *Temperature.*—In those rabbits injected through the auricular vein a fall of temperature occurred three hours after the injection.

In those injected through the mesenteric vein the temperature became elevated three hours after the injection.

On the second day the temperature was above normal in both series of animals, and was thus maintained for two or three days. Afterward it slowly descended to the normal, but more gradually in those which had been injected through the auricular vein.

5. *Condition of the Blood.*—On the day after the injection a slight leucopenia was found in those animals injected through the auricular vein. This was maintained until the fourth day, showing, however, a gradual progressive diminution. All varieties of the white corpuscles were equally affected, so that the leucocyte formula was practically unchanged.

From the first day after the injection there was a marked increase in polynuclear cells in those animals which had been injected through the mesenteric vein.

The combined result of these observations shows that the intoxication produced by the fecal injections was more profound in those animals injected through the auricular vein. This circumstance led the investigators to believe that the toxic substance injected through the mesenteric vein was arrested and probably neutralized by the liver.

THE EFFECT OF NICOTINE ON THE CIRCULATORY SYSTEM.

Dr. K. GRASSMAN, of Munich (*Münchener medicinische Wochenschrift,* May 14, 1907), after carefully reviewing the experimental and clinical evidence relative to the effect of nicotine on the organs of circulation, states that the excessive use of tobacco, particularly if it be begun in youth, exerts an undoubted causative effect in the production of arteriosclerosis. Its exact influence, however, has not been accurately determined by experimentation owing to the impossibility of reproducing the associated conditions obtaining in the majority of cases in which tobacco is habitually used. Thus the common associated use of alcohol, tea, and coffee, as well as the possible influence of severe bodily and mental effort, has to be reckoned with as possible causative factors in the production of the changes in the blood-vessels.

Granted that the excessive use of the

drug favors arteriosclerosis, especially of the peripheral vessels, still it is not right to assume that the milder cardiac disturbances which it produces, such as increase in the frequency of the pulse, arrhythmia, and tobacco angina, predispose to disease of the heart muscle itself and to degenerative or sclerotic processes of the vessels. So many of these disturbances disappear upon the withdrawal of the poison that they cannot be considered dependent upon structural changes.

Grassman believes that the duration of the intoxication is more important than its subjective manifestations. Thus it is conceivable that the heart might become hypertrophied as the result of increased pulse-rate and blood-pressure caused by the action of nicotine.

The use of tobacco is so general that the factor "smoking" appears in the history of a great many cases of heart disease. Whether heart disease is less frequent in those who abstain entirely from the weed than in those who use it has not been determined by the study of a large number of cases.

In conclusion the author states that he thinks too little importance has been attributed to the influence of nicotine.

ADRENALIN AND NOVOCAINE FOR ENUCLEATION OF THE EYE.

Professor SIEGRIST (Berne) makes the following observations on local anesthesia for the evisceration and enucleation of the eye in the *Monats-Blaetter für Augenheilkunde* for January, 1907:

"For the purpose of producing local anesthesia I have used a glass syringe, with a capacity of 2.0 grammes and a slightly bent point, for years. After the conjunctiva has been anesthetized by three instillations of a two-per-cent sterilized cocaine solution, to which several drops of adrenalin have been added, I seize the conjunctiva bulbi, including the capsule, above, below, nasal and temporal, with pincers, drawing it somewhat forward, and introduce the bent point of my syringe into the fold of the mucous membrane with the concavity toward the bulbus, and am thus enabled to introduce the point between the bulbus, as far as the point of entrance of the optic and ciliary nerves. Thus I am enabled to quickly make four injections, above, below, nasal and temporal, of 0.75 Cc. in each instance of a two-per-cent novocaine solution, to which some adrenalin has been added, in the vicinity of the entrance point of the ciliary nerves (some drops of adrenalin should be added without fail to the two-per-cent novocaine solution after sterilization).

"One or two minutes after these injections one can begin with the evisceration or enucleation. If the injections have been made properly, the patient does not experience the least pain during the operation, no matter if the eye is sensitive to pressure or greatly inflamed.

"This method of local anesthesia takes the place of general anesthesia, and is much more simple and not so dangerous."

CHRONIC GASTRITIS.

In the *Journal of the American Medical Association* of April 20, 1907, CHASE advises the following plan of treatment, which is to overcome the inflammation and if possible to restore the secretion and the impaired motor power of the stomach. Since any single cause of the inflammation is rarely discoverable, we must remove all conditions which may be considered as contributing factors. Hence, good hygiene is advised, which means regular habits as to eating, exercise, and action of the bowels, repair of carious teeth, etc.

In this state starches are better digested in the stomach than under normal conditions, while proteids are but poorly cared for here, being digested almost entirely in the intestines. Bearing this point in mind and remembering that all mechanical, chemical, and thermal irritants are to be avoided, we have the key to dietetics in this disease.

The articles of food to be allowed the author has checked from a printed diet list, usually advising three meals a day, with

one or two lunches if desired. Of the more restricted diet in the beginning of treatment the patients will rarely eat too much, while if the scales show a maintenance or increase of weight he feels that they are eating enough, regardless of the number of calories which the food represents. Cooked fats he has found are not usually well borne. No alcoholic liquors are allowed.

To free the stomach of mucus and to stimulate secretion and peristalsis, douching of the stomach internally with a warm alkaline and saline solution is, in the opinion of the writer, the most valuable means we possess. For this purpose he employs his stomach apparatus, using the Rosenheim tube. The solution is injected with the amount of force desired, but it is always greater than that obtained by ordinary lavage. By the douche he believes that adherent mucus is more thoroughly removed than by simple lavage, while the stimulating action of the small, forceful streams must be far greater than that produced by pouring water into a tube which has but one or two large eyes. In fact, he feels that douching of the stomach in gastritis and other conditions will become a more popular means of treatment when its technique and results are better known.

Riefel agrees that "the internal douche may frequently be employed with profit in chronic gastritis. It may be useful under certain conditions to force the fluid into the stomach under pressure." Douching or lavage should be done at least twice a week, and always with the fasting stomach. The agents which he usually employs are sodium chloride and sodium bicarbonate, 30 grains of each to a pint of water at 100° F. "Washing out" the stomach with copious draughts of medicated water seems but a poor substitute for douching.

For the purpose of dissolving mucus and increasing the secretion he uses from 10 to 15 grains each of sodium chloride and sodium bicarbonate in a glass of warm water, to be taken about fifteen minutes before meals. Some of the saline mineral waters may serve the same purpose in a measure, so also may some of the more elegant preparations containing the various salts. The phosphate or sulphate of sodium may be used, especially if there is constipation; nux vomica, condurango, and other bitter tonics may be of service, but of late he has rarely used them.

The author has elsewhere expressed his views regarding the use of hydrochloric acid and pepsin. He believes that the large doses of from 15 to 20 minims of HCl fail to accomplish the desired object; moreover, he feels that they may do harm. Small doses of from 5 to 10 minims may in some ways prove beneficial, but he considers that there is no evidence to show that they stimulate the secretion of HCl.

Vacations and out-of-door exercise are important and at times seemingly necessary factors in the cure of gastritis.

MUCOMEMBRANOUS COLITIS.

Those who have much experience of these cases know how difficult the management of them is, great patience and perserverance in treatment being required by both medical attendant and patient. At the outset of treatment we naturally eliminate any known cause, so far as this lies in our power, but sometimes we find the exciting cause is no longer in operation. Next we must adopt the best means of overcoming the stasis of the bowel and procure a regular and complete evacuation of its contents. The necessity of this is apparent, since it is the retention of mucous secretion, feces, products of putrefaction, and microbes which causes the constitutional disturbances and increases the local irritation. Moreover, requisite means have to be taken to improve the mucous membrane and the muscular coats of the intestine. For evacuation of the bowel aperients prove unsatisfactory in colitis. They never effectually clear the bowel without producing considerable local and general disturbance, and really aggravate the condition. As they lose their power, in course of time the patient requires to take larger quantities and take them more frequently, thus making the local condition increasingly worse. Probably the best means

of evacuating the bowel and at the same time lessening its irritation is by colon irrigation. When this is properly administered it clears the bowel more effectually than aperients do, and instead of having a pernicious effect its action is most beneficial. A somewhat extensive experience has taught the writer the value of this method, and that it is by far the best way to commence the treatment of colitis. It has to be carried out with very great care and under certain restrictions, as it may do harm instead of good. But properly administered its value is undoubted. The fluid used must be of a bland, unirritating nature. It must also be given under a low and equable pressure, or painful spasm and irritation of the colon will occur. The temperature and the quantity of the fluid are also matters of importance.

A brief description of the mode of procedure employed at Harrogate will illustrate these points. The patient reclines upon a couch, at the foot of which is placed the apparatus for washing out the colon. This consists of a double cylinder, with a float in the lower cylinder, which regulates the escape of water from the upper, so that the same pressure is maintained throughout. The cylinder glides on two graduated uprights which mark the height and pressure and is moved to the height prescribed. There are a thermometer attached to the cylinder and a gauge to register the quantity of water, both sufficiently large for the patients to observe for themselves whilst lying on the couch. One of the sulphur waters is used for irrigation. The quantity prescribed may be from 10 to 40 or more ounces for each douche, and is usually repeated. The temperature varies from 96° to 104° F. or more, depending on the condition of the bowel. A long tube is passed per rectum into the sigmoid flexure, and the sulphur water gradually passes through it into the colon. This is retained several minutes by the patient, and is then ejected into a flat-bottomed receptacle. The douche is always given by a skilled attendant, who examines the ejecta and reports to the medical attendant.

Immediately after the internal douching the patient goes into an adjoining room and steps into a warm sulphur bath. While reclining in this a hot douche is directed through the water to the abdominal wall. It is delivered through a large nozzle with numerous fine perforations and moved slowly over the site of the colon. There are several therapeutic actions produced by this internal and external treatment besides the mechanical one of clearing out the intestine. The internal douche acts as a warm bath upon the intestine, the heat of this soothing it and the neighboring organs. Then the sulphur water brought in contact with the mucous membrane produces its well-known action of diminishing catarrh and restoring the mucosa to a healthy condition. Again, Sir William Ramsay has found that the stronger of the sulphur waters used is radioactive, and doubtless this property is beneficial, producing a sedative effect upon the bowel and the body generally. Another important action of the internal douche is free diuresis. This arises partly from the kidney being stimulated by the hot internal douche, though chiefly from the absorption from the bowel of some of the sulphur water, part of which is retained and subsequently secreted. This flushes out the liver, kidneys, and tissues, and carries away some of the toxins already absorbed.

When we come to examine the effects of the external treatment we find the warm sulphur bath soothes the nervous system and induces a sense of comfort in the patient. It determines an increased flow of blood to the skin, stimulating its glands and improving its nutrition. This in turn has a healthy influence upon the colon, as there is undoubtedly a close relationship between the skin and the intestine, a state frequently demonstrated in colitis. The external douche applied to the abdominal walls has an extremely soothing effect upon the colon, relieving pain and spasm when these exist. Further, the impact of the tiny jets of the douche stimulates the intestine and promotes muscular contractility in the distended portions. It is an interesting fact that the relief of spasm in one part of the intestine

and increase of contractility in another will take place at the same time, probably from the irritation of the intestine being allayed. After four or five weeks of such treatment a marked amelioration is produced in the patient's condition. The catarrh is lessened, pain and spasm are alleviated, and constipation is relieved.

Coming to the general symptoms, the first thing noticed is the improvement in the appearance of the skin. In a few days it becomes clearer and brighter. Next, if there is glycosuria it usually quickly disappears, as does also the stool pallor. Soon the patient feels better and becomes brighter and happier. The neuroses, which are generally the most troublesome features in severe cases, improve slowly, though in the milder forms of the affection they are soon ameliorated. One remarkable circumstance is the effect of treatment on a loose kidney. After some months of effective treatment it becomes much less movable, and in some cases when recovery from colitis has taken place the kidney becomes practically fixed. In severe cases of colitis one course of colon irrigation is not sufficient. It must be repeated once or oftener after an interval, depending on the state of the patient at the end of the course and subsequently to it.

During the last three or four years this treatment has been employed at Harrogate in several hundred cases of colitis. The excellent results which have been achieved have exceeded expectations. The results prove that the method is both rational and successful and that it is destined to become an essential part in the treatment of many cases. The same kind of treatment has been carried out at Plombières and Châtel-Guyon for several years.

Careful dieting during and after the course of douching is imperative. Foods which are easily digested and leaving only a small and unirritating residuum are best. In the experience of the author the diet advocated by von Noorden proves unsuitable. Further, the patient should be instructed to eat only a small amount of animal food, since it is a fruitful source of putrefactive material. They require to be warmly clothed and be careful to avoid chills, which are apt to increase the catarrh of the colon. Warm, bright sunshine is a valuable aid to treatment and sometimes is indispensable. Moderate exercise should be regularly taken in the fresh air, that of an upland or mountainous character being especially beneficial. Moderation is essential in food, drink, exercise, and pursuits. In short, the scriptural injunction, "Be ye moderate in all things," applies more to patients affected with colitis than perhaps to any others.—*Lancet*, May 18, 1907.

A COMPARISON OF THE THERAPEUTIC ACTION OF THE VARIOUS COMMERCIAL SALTS OF QUININE.

Quinine and its salts contain different proportions of the alkaloid owing partly to the presence of water of crystallization and partly to differences in the relative weights of the acids combined with the alkaloid. The percentages of alkaloid in quinine and its more important salts are as follows: Quinine, 85.7; quinine sulphate, 74.1; quinine bisulphate (acid sulphate), 58.8; quinine hydrochloride, 81.5; quinine bihydrochloride (acid hydrochloride), 81.6; quinine hydrobromide, 76.4; and quinine salicylate, 68.5. They differ widely therefore in alkaloidal content, the sulphates being the weakest. But the ordinary sulphate was the first salt of quinine to be used widely, and it remains to-day the most popular salt, owing probably to the fact that the superiority of other salts of quinine is not generally understood. This is shown by Dr. R. Howard in a note on the prophylaxis of malaria in the *Chemist and Druggist* of March 23. The bisulphate of quinine was introduced on account of its greater solubility as compared with the ordinary sulphate; but it carries a large quantity of sulphuric acid into the stomach, and so causes indigestion. The hydrobromate and hydrochloride are recommended by Dr. Howard on account of their ready solubility and high alkaloidal content, as well as owing to the fact that they are less liable than the sulphates to disturb the digestion. Dr. How-

ard considers the bihydrochloride to be the best salt of quinine for internal administration; it contains a large percentage of quinine and it is soluble in its own weight of water, so that even in tablet form this salt would not be likely to pass undissolved through the system. The bitter taste of the bihydrochloride is its only drawback, and this it shares with the other more soluble salts of quinine.—*Lancet,* April 30, 1907.

THE COST OF FLAVOR.

Physiological chemists occasionally delight to tell us that we are the dupes of esthetic senses and pleasing flavors. Men will pay, they say, half a guinea for a pint of turtle soup which, from a strictly nutritive point of view, is not worth a twentieth part of that sum. Oysters, we are told, are an extravagant form of food, since fourteen of them do not contain as much nourishment as a single egg, and it would require the ingestion of no less than 200 good oysters before the protein equivalent of a pound of beef was reached. Caviare, again, is not to be compared with the bloater as regards its nutritive value; indeed, the latter "offers the largest amount of nutriment for a given sum of any animal food." It is evident if we regard these conclusions seriously that a large section of the human race is wickedly indulgent, caring more for the palatable than the nutritious quality of food. The same appears to be true in regard to beverages; and even in the case of cigars there is no difference, chemically speaking, between the penny Pickwick and the shilling Havana. The difference of 11d. is paid for flavor, and flavor alone. Physiologically it is possible that a "brandy-and-soda" costing, say, 1s. is just as satisfactory as a "pint" of champagne at 5s. Similarly it may be said that a pint of beer at 6d. is quite as good, dietetically speaking, as a small bottle of Chateau Margaux at 3s. 6d.

There are, however, clearly instances in which in no sense can the nutritive equivalent of food and beverages be summed up in so many pounds, shillings, and pence. How often is it found, for example, that the invalid may be tempted to take a few oysters in preference to a small beef fillet, or some turtle soup when calves' head, the basis of mock turtle, would scarcely appeal to him, even although it may be more than equal in nutritive value to the only reptile used to any extent as food in England. Whenever a person refuses to take a given food, however nutritive and wholesome it may be, because it is not tempting to the sight or the palate, it is in many instances probable that if he struggles to overcome his fastidiousness such food may prove to tax his digestive functions and may even cause gastric trouble. The chemical analysis of food and physiological experiments in the test-tube do not take into account this psychical factor of digestion, for the digestive process is well begun when the sight of food is pleasing. On the contrary, when food does not appeal to the eye it is likely not to appeal to the stomach. It is hardly reasonable to conclude, therefore, that the price of flavor is always the price of luxury. It is wrong, of course, to give way constantly to the promptings of the fanciful palate, and there is little doubt that when this outrage on a healthy function is permitted it is akin to the evil which follows the frequent imbibition of alcoholic drinks. In both cases overstimulation wears out the normal impulses. The man who enjoys plain food is miles ahead, physically and physiologically speaking, of the man who would leave his meal untouched if it were not that every item of it was calculated "to tickle the palate."—*Lancet,* May 18, 1907.

ADRENALIN IN PURPURA.

Biondi (*Centralblatt für innere Medicin,* 1907, No. 4) treated a thirteen-year-old boy, who was afflicted with Werlhof's disease (purpura hemorrhagica) with ten injections of a ½-per-cent adrenalin solution in ten succeeding days. There were immediate cessations of the hemorrhage, and the patient recovered rapidly and soon ceased to be anemic, but the fever was not influenced by the injections.

SOME INDICATIONS FOR THE TREATMENT OF CHOLERA.

In the London *Lancet* of April 30, 1907, CHOKSY says that the choice of means for restoring to the system the loss of fluids is limited to but three: (1) transfusion of saline fluids; (2) hypodermoclysis; and (3) enteroclysis. The first is not easy of application in epidemic times, requiring skilled assistance and other facilities; the second, apart from being painful, often gives rise to cellulitis in spite of all aseptic precautions, and entails prolonged convalescence and tardy recovery. Reliance should therefore be placed on the last, and rectal injections of one pint of normal salt solution made with boiling water and cooled to about 100° F. are administered at intervals of four hours. If the hips are well elevated, and the injection given very slowly by a gravitation douche raised to about four to five feet above the level of the bed, with a soft-rubber tube inserted high up, from 10 to 12 inches, it is painless, without discomfort to the patient, and is almost always retained; occasionally an ounce or two may be expelled after an hour or so. It is not, however, practicable to give the injection if the frequency of stools is great, nor is it required in the early stage if the drain from the system can be checked. But in the advanced and collapse stage such injections are of great utility, as the fluid is rapidly taken up by the system and by diluting the blood renders it less viscid and therefore easy of circulation. Circulation is thereby restored and urinary secretion is stimulated. Under their influence the patient loses that haggard and pinched appearance so characteristic of cholera; the flesh does not appear shrunken nor the eyes sunken and hollow—in fact, the aspect of the patient in most of the cases is placid and not at all typical of cholera. The frequency of the injections is gradually reduced as the patient improves, and after the urinary secretion has become freely established they are stopped.

The indication to keep up the circulation and so reëstablish the functions of the kidneys is met partly by the measure above detailed and partly by the use of drugs acting directly as well as indirectly upon the heart and the kidneys. With this object the following formula is employed in doses of 20 minims, in an ounce of water, administered every two, three, or four hours according to the state of the pulse:

> Caffeine sodio-salicylate, 2½ grains;
> Sparteine sulphate, ½ grain;
> Liquor atropinæ (B. P.), 1 minim;
> Spiritus vini Gallici, q. s. ad 20 minims.

Coldness of the extremities and profuse, clammy perspiration are readily controlled by the atropine; in addition, hot-water bottles, or foot and body warmers, sinapisms to the calves, and friction of the limbs with dry ginger powder are often resorted to. Hot linseed poultices to the abdomen and loins are continually kept on and changed every two or three hours. In order to encourage urinary secretions, if defective in spite of the above measures, poultices of digitalis leaves are utilized, and often dry cupping is supplemented with good results. The above measures are in most cases effective in keeping up the circulation and reëstablishing the function of the kidneys.

The all-important question of nourishing a cholera patient presents many difficulties. The extreme irritability of the stomach and the almost total inhibition of all digestive and absorptive powers indicate that the alimentary system, already so gravely perturbed by the cholera bacillus and its toxins, is in no mood to tolerate any further irritation. The stomach instantaneously repels all irritants—even the blandest nourishment is but an irritant at the time—and sounds a warning to hold the hand. It is well to listen to it. The alimentary tract must have time to throw off the poison and to recoup itself until its natural functions become reëstablished. Absolute physiological rest is indicated and should not be withheld. It is best therefore to stop all food and all alcoholic preparations. The latter considerably aggravate the irritability of the stomach, are generally rejected as soon as administered, and with-

out doing any material good to the patient exhaust him by frequent rejections. If they are administered with the object of stimulating the heart the object is defeated, inasmuch as each act of vomiting adds to the exhaustion and restlessness of the patient. No alcohol, no milk, and no meat preparations, is a salutary doctrine under the above conditions. The only nourishment—could it be so called—allowed is hot black coffee without milk and without sugar. This is administered day and night as frequently as the patient requires a drink. It is usually retained and quenches thirst far better than cold fluids. It is curious to notice that excessive thirst and that wild craving for cold liquids so characteristic of cholera are absent among the patients treated on the above lines, the caffeine probably soothing the irritability of the stomach which is not otherwise irritated, and the rectal injections supplying the fluid to the system, and thus relieving thirst indirectly. The patients bear the deprivation of food well, and even among children the distress from its absence is not so evident as one would be led to expect. Black coffee is thus administered for from three to five days, until the functions of the kidneys are restored, and there is a change in the character of the stools. Thereafter thin arrowroot coffee, slightly sweetened, is allowed, to which subsequently milk is gradually added. After the disappearance of all acute symptoms plain biscuits, rice and milk, plasmon, and later fresh mutton broth are allowed.

As the stage of reaction is but a manifestation of toxemia, it requires careful watching. It is, however, not well marked nor invariably present in the cases treated by the above method. Violent fluctuations of temperature are practically unknown; the body warmth, already so well sustained, gradually returns to normal without attaining to any great height, and the danger always associated with this stage is practically non-existent. The treatment becomes thus considerably simplified, inasmuch as before this stage is reached the greater portion of the toxins have been eliminated and the risk of acute toxemia altogether averted. High temperature, reaching to 104° F., is but rarely observed, and the acute delirium that occasionally accompanies it is also an equally rare occurrence. An alkaline mixture containing sodium bicarbonate, citrate of potash, with tinctures of digitalis and nux vomica, is all that is needed, as it acts both as a diaphoretic and diuretic. Antipyretics are not necessary. Should the delirium be acute the bromides with tincture of hyoscyamus are indicated. If very violent, hyoscine hydrobromate or even morphine may be required.

Symptomatic treatment may be required for occasional persistent vomiting, for after-diarrhea, or for prostration, and sometimes to encourage the sluggish functions of the kidneys which after partial efforts at reaction appear to lapse again. Persistent vomiting is controlled by cocaine hydrochlorate in doses of one-eighth of a grain dissolved in a teaspoonful of water, or mistura pepsini composita cum bismutho (sine opio) in ten-minim doses, administered every quarter or half an hour until four doses have been administered. Crushed ice is sometimes also useful. The after-diarrhea can be treated by bismuth, or, better still, by dermatol. Prostration is overcome by hypodermic injections of camphor (camphor 2, ether sulphuric 3, and olive oil 7) in doses of 20 minims every two or three hours. The measures above described for encouraging urinary secretion have to be reëmployed with greater vigor for restoring urinary functions. Dry-cupping is especially useful and may be freely employed.

The only sequelæ requiring attention are parotitis and stomatitis. They are treated on general principles.

THE OPSONINS.

MUMFORD in the *Boston Medical and Surgical Journal* of March 28, 1907, says that a question which is frequently asked, and it is a practical question, is, How can the average busy practitioner employ these

measures? Frankly, one cannot employ them unless he is in touch with a laboratory and laboratory workers especially equipped. The technique is laborious and time-consuming. Two or three cases may easily occupy all the time of one investigator, although it is becoming apparent that certain common infections, like boils and carbuncles, may be treated with stock vaccines kept for that purpose. Such rule-of-thumb work may answer in routine dispensary practice, but would be largely futile when one came to deal with more serious cases. Be it said, however, that average inoculations, even though given in error, are found to be harmless when given for localized infections.

There is the further question of the value of opsonins as a diagnostic agent. This is a matter which is still *sub judice,* although, as Ross states, certain general principles have emerged from the study of many cases:

1. Normal individuals not the subjects of any bacterial infection present a constant opsonic power to the various pathogenic bacteria. (This statement is still subject to question, probably on account of errors in technique.)

2. Individuals the subjects of a strictly localized infection, due to any microörganism, show a lowered opsonic index to that particular organism as compared with a normal person.

3. Individuals the subjects of systemic infection show a high, or fluctuating from high to low, opsonic power.

This last condition of fluctuation is probably due to the "negative phase" and "positive phase." The "negative phase" follows a vaccination for twenty-four hours. The index falls at first, and then ("positive phase") rises up to or above the normal. Ross quotes a case in illustration of the opsonic method as used in the diagnosis of an obscure case.

The patient entered the hospital with a provisional diagnosis of general tuberculosis. His tuberculo-opsonic index was found to be 1.0 (a figure slightly above the normal for tuberculosis—an exception to the rule that 1.0 is normal). The physician suspecting the possibility of a gonococcal infection estimated the opsonic index to the gonococcus, with the result that it was found to be twice normal, a condition of the blood which is almost certainly associated with a gonococcal infection only, and indicates that the patient's own infecting organisms were oversupplying him with opsonins. Further investigation confirmed the diagnosis of gonorrhea with a general infection.

Surgeons are not especially concerned, however, with infections of that type which fall within the province of the internist, though we are coming to feel that certain properly surgical affections are yielding hopeful results when subjected to opsonic therapy: furunculosis, pustular acne, chronic empyemata (after drainage), cystitis, and especially the various wound infections due to staphylococci and colon bacilli. In Boston they are by no means convinced of the value of opsonic treatment in cases of tuberculous adenitis, although Wright makes positive claims in such cases. It was hoped at one time that various obscure and obstinate joint infections would show positive results from opsonic therapeutic and diagnostic measures, but although a few encouraging cases have been encountered we cannot feel as yet that positive results have been obtained. This is true not only of tuberculous joint lesions but of joint lesions due to other organisms, and the probable reason is that we have not yet been able to isolate and study some of the organisms which we assume to be the causative agents in many obscure cases of arthritis.

The reader will see, therefore, that surgical progress in the use of opsonins is not yet in a positive position—surgical progress in this community at least. One may describe our attitude toward the question as generally hopeful but still somewhat puzzled. There is no doubt that some cases, notably staphylococcus and colon cases, have been greatly improved or cured, but we feel that the whole subject is embryonic as yet, and that a deal

of work remains to be done before we can record the opsonins invariably and confidently among the important agents at our command.

THE TREATMENT OF TUBERCULOSIS BY MARINE CLIMATES.

EWART reminds us in the *British Medical Journal* of April 27, 1907, that ocean climate differs from all others in its exclusively marine character and its equability, in contrast with the sea-coast climates, which are the most variable and offer endless combinations between the features of the coast and those of the sea, none of them being the ideal one for consumption, because not always at their best, whilst some may prove to be too protective in the individual case, and others too active for some of the complications.

Climate and open air can have no direct effect upon the bacillus, and the beneficial effects of the seaside and its sea air are mainly dependent upon the patient's power of "reaction" on the one hand, and on the other upon the all-important effect upon the tendency to catarrh.

Touching the forms of tuberculosis, Nathan Raw has recently urged an etiological and clinical distinction between the infection from the "bovine" bacillus and that from the "human" bacillus, which agrees well enough with our climatological data and practice, all cases of "bovine" infection (surgical, glandular, scrofulous, cutaneous, serous, and visceral other than pulmonary) being almost unreservedly benefited by the sea. This is not always the case with the pulmonary affection, for which alone the "human" bacillus invasion would be to blame.

The multiple types evolved by individual predispositions (constitutional, organic, and functional) fall into the two groups, uncomplicated tuberculosis and catarrhal tuberculosis, or phthisis pulmonalis. In the first group tuberculosis may be "latent" and healing, or "declared" and spreading. In the second (which includes the acute caseous form) catarrh is the chief agent of mischief as well as the first object of climatic treatment. To describe as "consumptives" the bearers of latent and spontaneously-healing tubercles would be inaccurate; and, on the other hand, "tuberculosis" does not depict the varied miseries of catarrh, of pneumonia, and of caseation in the painful record of advanced consumption. Bacillary infection ("tuberculosis" *per se*) may mean little or much damage, but "consumption" (or, in the Greek vernacular, "phthisis") is always a big affair, and in pathology it spells "catarrh." We now have to reverse the famous dictum of Niemeyer, and to recognize that "the worst fate that can befall the patient infected with tubercle is that he should develop phthisis."

The aerotherapeutics of tuberculosis are thus, practically speaking, those of catarrh; but whereas sea air is curative of some forms of simple non-bacillary bronchitis, it is not always sufficiently dry for the cure of catarrh based upon tubercle. Whether we consider the meteorological factors or are guided by the results observed clinically, it cannot be gainsaid that the altitude is likely, and proves itself, to be more effectual in obviating early catarrh and curing it at any of its stages than the climate of the coast. In this connection Dr. William Gordon's investigations upon the influence of wet winds are most suggestive, although he has not hitherto formulated any conclusions beyond the broad fact that the prevalence of phthisis is definitely increased by it.

But where there are not any altitudes available, the writer advocates adopting an opportunist policy and making the most of an unrivaled assortment of "protecting" and "bracing" seaside resorts by careful selection of cases, by progressive elaboration of their clinical treatment, and by measures tending to correct any imperfections of the local climates. The "bracing" resorts possess the highest restorative efficiency, but their suitability for pulmonary tuberculosis is limited. The criterion of fitness for these climates is integrity of the mechanisms of "reaction," which are dependent above all upon cardiopulmonary

efficiency. Thanks to the possession of sound lungs and of a sound heart, the great majority of cases of tuberculosis other than pulmonary—surgical, scrofulous, cutaneous, etc.—are eligible for the bracing resorts and derive there the greatest benefit. Many cases of "latent" pulmonary tuberculosis are for analogous reasons eligible. But "declared" pulmonary tuberculosis, even at an early stage, and "early phthisis pulmonalis" claim the most careful climatic management, with a view to the avoidance or the cure of catarrh, and need protection from the stronger kinds of sea air. All cases of "advanced" phthisis, as well as the group of "'chronic quiescent phthisis," admit of no alternative —they are to be sent to the milder stations.

The present position of the treatment by marine climates rests upon the recognition of the fact that mere "airing" and "salting" are not competent of themselves to cure the pulmonary complications of the disease when it affects the lungs. "Open air" and "sea air" are a basis for treatment, but cannot supersede the scientific methods of modern therapeutics. The marine resorts should add to their natural resources increased facilities for a systematic treatment planned upon a combination of the hospital idea and of the sanatorium idea. On this scheme alone can they look forward to an increased curative efficiency.

Meanwhile a much greater field of usefulness is open to them in prevention. The sanatorium movement is gravitating in that direction; but the seaside is *par excellence* the place for the "prevention-sanatorium" or "preventorium," the inmates of which should be recruited from the most threatened ages and from the most dangerous surroundings. This is the direction in which a more extensive and systematic use of marine climates is indicated. Their wider employment for the extirpation of tuberculosis in the coming generation is a possibility and a public duty.

Lastly, the task of improving the local opportunities for climatic treatment is not beyond the skill of modern engineering. Some of the prosperous stations rejoice in a sandy soil suitable for the growth of the pine; others in a mild and sunny hinterland; others in cliffs combining available shelter and altitude.

THE INDICATIONS FOR THE USE OF OPIUM.

STOCKMAN in the *Practitioner* for May, 1907, when writing on this subject reminds us that the value of opium in lessening spasm of involuntary muscles is seen in the treatment of lead colic, when the action of the metal induces a painful contraction of parts of the bowel with severe constipation. The relaxation of the spasm allows purgatives to act satisfactorily, and abolishes the severe pain. In tenesmus from any cause a suppository or enema containing opium is usually efficacious. In hepatic and renal colic it is a most valuable remedy, and here, as in lead colic, it may be advantageously combined with belladonna, or nitrites. In strangulated hernia it may aid reduction, and in severe vomiting, obstruction of the bowel with spasm, spasm of the cervix uteri, irritation of the bladder, and similar conditions, its antispasmodic action may often be used with great benefit. In all such cases morphine probably acts by depressing the local nerve ganglia which control the muscle fibers.

In treating dyspnea with morphine, great discrimination in its use has to be observed. In pulmonary dyspnea, as in pneumonia with much consolidation, or bronchitis with excessive secretion, in edema of the lungs, and in general dropsy from cardiac or renal disease, morphine should be regarded as dangerous, owing to its depressing effect on the respiratory center, which should be maintained in as active and as sensitive a state as possible. But, on the other hand, when dyspnea is a prominent symptom in aortic disease, dilated heart, and pericarditis, and in attacks of so-called cardiac asthma, and when the respiratory disturbance is primarily of cardiac origin and the activity of the center is exhausting and detrimental

to the patient rather than beneficial, morphine should be given. The respiratory center in these cases is probably unduly excited, and the drug exercises a calming effect on it. In the distress of a sudden pneumothorax it often gives great relief in the same way. Many cases clinically present a mixture of these two causes of dyspnea, and then much care requires to be exercised in the use of opiates. In bronchial asthma nothing gives such complete and lasting relief as a hypodermic injection of morphine, but its action here is really an antispasmodic one and comparable with that on other non-striped muscles. Some time ago Dr. Thomson, of Uddingston, drew the attention of the writer to the fact that 1/12 to 1/8 grain of morphine, given hypodermically, with 5 to 8 minims of adrenalin solution (1 in 1000) was even more active than morphine alone in cutting short the spasm, and this the writer affirms from his own experience of several severe cases.

It is hardly necessary to dwell on the usefulness of opium in checking acute diarrhea from any cause, or on the necessity, in certain cases, of first giving a purgative. In bronchitis, with much watery secretion, small doses, combined with belladonna, sometimes greatly help in checking the discharge.

SOME RECENT RESEARCH WORK ON ANESTHETICS.

Prof. G. A. Buckmaster and Mr. J. A. Gardner have undertaken experiments since 1905 with a view to ascertaining the relation into which inhaled chloroform enters with the blood, and their results were given in a recent communication to the Royal Society. In the present research cats were selected for use in most of the experiments, as the phenomena of chloroform action upon these animals have been shown by MacWilliam to resemble closely those evinced in man.

Previous workers have supplied data on the amount of chloroform found in blood after anesthetization; thus Lallemand, Perrin, and Duroy found that 100 grammes of blood contained 1 cubic centimeter of chloroform vapor in the blood and tissues of dogs killed by the anesthetic. Gréhant and Quinquaud by a more exact method found 1 gramme of chloroform in 1800 to 2181 grammes of blood, the estimation being taken at the moment of anesthesia in dogs. Pohl, in a series of elaborate determinations, employing a modification of Schmiedeberg's method, arrived at the average amount of chloroform present in the blood of animals killed by chloroform as being 0.035 gramme per cent. The very interesting researches of Nicloux and J. Tissot are considered at length in the present paper. The contention of Desgrez and Nicloux that chloroform becomes decomposed, and that carbon monoxide is present in the blood after prolonged chloroform inhalation, is not borne out by the experiments of Buckmaster and Gardner.

To determine the amount of chloroform in the anesthetized animals Buckmaster and Gardner relied upon the difference in the chlorine content of the blood before and after inhalation of chloroform, samples of the blood being withdrawn at intervals during the experiment. The chlorine was estimated by the method of Carius, some special precautions being adopted to insure accuracy. The anesthetic was given through a tracheal tube either from a Woulfe's bottle or from a bag containing a mixture of known strength obtained by Dubois's apparatus.

Reviewing the experiments as a whole, the investigators propound the following conclusions: The amount of chloroform in the arterial blood of cats at the moment marked by cessation of the conjunctival reflex in both eyes is estimated as between 14 and 27.6 mg. per 100 grammes of blood. The amount varies according to individual peculiarities of the animals, but the percentage of chloroform in the blood necessary to produce anesthesia is not affected by the body weight of the individual. The rate of induction is also variable, and does not appear to be wholly dependent upon the percentage of chloroform in the inspired air. The lethal dose capable of

abolishing respiration is also variable, being on an average 40 mg. per 100 grammes of blood. This dose is very near the anesthetic dose; indeed, all recent workers have shown how narrow is this margin between the amounts of chloroform in the blood which are necessary on the one hand to induce anesthesia, and on the other that degree of narcosis which is marked by cessation of respiration and death. The elimination of chloroform after its inspiration has ceased is rapid and less variable than that of its absorption. The important question, How is the inspired chloroform distributed between the corpuscles and the plasma? is also considered in the present portion of Professor Buckmaster's report. The corpuscles appear in the case of cats to take up most of the chloroform; the plasma, unless the anesthetic is rapidly administered, or is pushed to an extreme point, remains free. This is also true of dogs, except that in their case chloroform appears to enter more easily into the plasma. These results agree, it will be seen, with those arrived at by Nicloux.

Professor Buckmaster and Mr. Gardner's research, the first portion of which is described, is certainly one of great importance, and, taken in connection with the reports of the Special Chloroform Committee of the British Medical Association, throws much light upon the vexed question, What is the percentage of chloroform in the blood which represents the state of anesthesia, and how far is this removed from the percentage which destroys life? Tissot asserts that no relation subsists between the proportion of chloroform in the blood and the effects of the drug, since these effects depend upon the quantity which acts upon the central nervous system and not on the absolute amount of chloroform in the blood. Again, the same observer has pointed out that the actual quantity of chloroform required to induce anesthesia is far less when the rate of induction is slow, so that in the case of rapid administration, as in that of the administration of high percentages, there is more or less surplus of chloroform in the blood, which may find its way to the central nervous system and produce lethal effects. These conclusions, arrived at from so many different points of view, all tend to accentuate the dangers of rapid anesthetization, as also of the employment of high percentage vapors, and thus tacitly condemn those methods which do not afford a means of controlling the percentage of vapor inhaled and the rate at which it is administered.

Dr. N. H. Alcock, in the course of a research upon the action of anesthetics on living tissue, has investigated the behavior of isolated nerve and that of frog's skin when subjected to the influence of anesthetics. Chloroform, ether, and carbonic dioxide affect not only the negative variation in mammalian nerve, as was shown by Prof. A. D. Waller, F.R.S., but influence also the injury current. Dr. Alcock's experiments, which are of a highly interesting and ingenious nature, appear to demonstrate that chloroform, ether, and probably alcohol also, are capable of producing an electromotive effect upon nerve tissue. In frog's nerve the maximum value of electromotive effect was found to be about 0.030 volt. This has the same sign as the current of injury. A further result of the action of chloroform or ether is a diminished polarization but no change in the resistance of the nerve. From his experiments Dr. Alcock infers that the electromotive effects are due to the same cause which produces the injury current, and as the resistance is not lessened no additional ions are formed.

The experiments dealing with the frog's skin are perhaps more important in the sense that they permit of wider generalizations, and they are less open to the ambiguity such as may exist in the case of the experiments upon nerve. Dr. Alcock is led to advance the theory that the action of the anesthetic probably lies in its power of entering a seimpermeable apparatus—in the case of nerve, an axis cylinder; in that of skin or cognate structure, a semipermeable membrane. Such a theory

seems to fit in with Dr. Alcock's experiments and to explain many of the recognized facts of anesthetic action. As the author of the research points out, the views of Prof. Benjamin Moore and Dr. Roaf, that anesthesia is "due to a paralysis of the chemical activities of the protoplasm as a result of the formation of such aggregates," harmonize and may even explain this power of permeation. The subject is one not only of great importance, but peculiarly fascinating, and will, we trust, be advanced further in the course of the prosecution of the researches which these experimenters are conducting.

Dr. E. H. Embley has reported to the Royal Society the results of an investigation into the pharmacology of ethyl chloride carried out in the Physiological Laboratory of the University of Melbourne. Dogs were selected for the experiments, but many initial difficulties were encountered. Ethyl chloride is soluble in water to the extent of 253.36 per cent by volume, and although it is freely absorbed by blood, the exact amount taken up is not easy to estimate, as the blood becomes of tarry consistence and "lakes" in the earlier part of the absorption process. It seems clear that, like chloroform, ethyl chloride enters into chemical union with the blood. Upon the isolated heart ethyl chloride caused paralysis, an effect common to it and chloroform, although nineteen times more ethyl chloride is needed. Similarly it causes relaxation of the arterioles when these are isolated from the central nervous system. Upon the central vasomotor mechanism ethyl chloride acts as a stimulant, at least for a time, and the net result upon the vasomotor system in the intact animal is dilatation, although the degree of paralysis is strikingly less than that caused by chloroform. Experiments with regard to vagus inhibition showed that although the heart was as readily stopped under ethyl chloride as it is under chloroform, yet under the former anesthetic the inhibition was never fatal, whereas under the latter it is frequently so. The cardiac inhibition appears to be due to central stimulation; it is not reflex. In concentrations of 10 per cent and over, ethyl chloride, according to Dr. Embley, produces paralysis of the myocardium quite comparable to that caused by chloroform in one-nineteenth of the above concentration.

With regard to respiration, these experiments indicate that with ethyl chloride, as with chloroform, the respiratory function is maintained so long as blood-pressure does not fail. The fall of blood-pressure, when it takes place, is due to vagus inhibition, and so in this respect ethyl chloride differs from chloroform, since under the latter the fall in blood-pressure is due in part to cardiac paralysis and in part to vagus inhibition. High concentrations (20 per cent) of ethyl chloride can, however, produce respiratory failure apart from any vasomotor effects. For dogs the limit of safety is placed at from 5 to 7 per cent in air inspired, and Dr. Embley is led to believe from his clinical observations that a like dosage should be accepted in the case of man. The value of Dr. Embley's work is great, especially at the present time when the use of ethyl chloride has become so general. There have been several deaths under this anesthetic, and it is to be hoped that a more accurate knowledge of its properties will obviate the repetition of mistakes which, in the case of a powerful drug such as ethyl chloride undoubtedly is, are liable to have serious if not fatal results.—*British Medical Journal,* April 20, 1907.

JOINT AFFECTIONS IN NERVOUS DISEASE.

In the course of an article on this subject by BARKER, in the *Journal of the American Medical Association* of February 2, 1907, he points out the great importance of the differential diagnosis of these arthralgias from organic disease, especially from tubercular gonitis and coxitis. The nocturnal exacerbations of the pain, which frequently occur in sleep and awaken the patient in tubercular coxitis, are absent in psychoneurotic coxalgia. On making passive or active movement of the joints in

cases of joint neurosis, the patients complain of "horrible, unbearable pain;" sympathy only increases the pain, while if the attention can be diverted temporarily the movements can often be carried out without severe pain. It is often found, further, that the pain is more intense in the skin and soft parts than in the joints themselves. Careful esthesiometric tests nearly always show a distinct hyperalgesia of the skin over the joints between the attacks of pain. In hysterical coxalgia, for example, there exists frequently an area of cutaneous hyperalgesia, triangular in shape, the apex of the triangle being at the lower margin of the symphysis pubis, the base at the middle of the sacrum. When the knee, elbow, or wrist is complained of, the hyperalgesia of the skin is usually cuff-like in form, the area surrounding the whole joint. During the severer neuralgiform seizures the hyperalgesia may change to a total hyperalgesia of one-half of the body. Analgesias are sometimes demonstrable in hysterical cases.

In psychoneurotic coxalgia the attitude of the lower extremity may resemble most closely that met in organic disease of the hip-joint; there may be apparent shortening, abduction, lateral rotation, or, later on, adduction and medial rotation. The limping gait, accompanied by lumbodorsal pseudoscoliosis, may strikingly simulate that of organic hip disease. Some of these patients refuse after a time to make any attempts to move their joints, and lie in bed for months or even for years.

A few cases of psychoneurotic arthralgia are associated with a higher grade of muscular atrophy than is commonly seen from simple inactivity, and these may be puzzling. According to Gilles de la Tourette, the atrophy differs from that of organic disease, being more general in the extremity with the psychoneurotic joint, while with the joint of organic disease it is localized chiefly in the muscles which extend the limb.

With *x*-ray examinations and tuberculin reactions organic arthropathies are now less likely than formerly to be mistaken for joint neuroses, but there is still danger that the psychoneurotic joint will be looked on as an organic disorder. Very skilled surgeons and physicians have been deceived before now; even to-day it is the neurologist who often saves the psychoneurotic joint from the knife and saw or plaster-of-Paris fixation. In doubtful cases the deep chloroform narcosis recommended by Charcot should be resorted to for diagnostic purposes. Not only do the contractures disappear when the patient is anesthetized, but a careful physical examination of the joint can be made and the physician can assure himself of objective negativity. In addition the phenomena observable during recovery from anesthesia are helpful in differential diagnosis. It is the sensitiveness of the skin which returns first in the psychoneurotic joint, the tenderness and pain in the deeper parts, elicited by tapping the trochanter or the heel, coming back later. It is only after the patient has rather fully recovered from the anesthesia, say in the course of from twenty to thirty minutes, that the deep pain and contractures return. It is just the opposite with the joints of organic disease.

The treatment of the psychoneurotic arthralgias should be mainly directed toward the general psychoneurosis which underlies the symptom. Nothing is more harmful than a predominantly local therapy. Isolation and psychotherapy are the sovereign remedies in these cases. After a thorough examination has been made and the absence of organic disease has been determined the patient should be told that the joint trouble is nervous in origin, and that, in the physician's opinion, there is no reason why it should not speedily get well. After a few days of complete separation from the family and friends, and when "medical obedience" has been fairly well established (frequently easily obtainable by encouragement and by keeping the patient for a short time in bed on a diet consisting exclusively of milk), the patient's intellect and will are to be appealed to by "persuasion." Passive

movements of the joints are to be begun and gradually increased; hydrotherapy and electrotherapy may be used as adjuvants. After a few days the patient may be induced voluntarily to move the joints a little, and very soon normal motility may be regained. The patient, through occupation, therapy and will-gymnastics, should be taught gradually to improve in self-control.

It is surprising to see the "wonderful" transformations of which psychoneurotics are capable when simple measures of the kind mentioned are employed. The length of time the symptom has persisted need not make one skeptical of recovery. The miracles of St. Anne de Beaupré and of Lourdes, of osteopathy and of Christian science, amaze the laity. Just as marvelous cures, but more lasting ones, attend the efforts of the physician who knows how to recognize quickly and to treat rationally the psychoneurotic manifestations.

DISLOCATION OF THE ANKLE.

Dislocation of the ankle below the astragalus is considered by three authors—MORIAN, LUXEMBOURG, and REISMANN (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 2). Each reports a case.

Reismann considers the mechanism of the joint and concludes that before the astragalus can be moved on the foot, the articulation between it and the navicular must be torn free. The articular surfaces of the bones are drawn apart when the foot is in extreme pronation and extension, and also in extreme supination and flexion. In the first case overextension tears the navicular from its articulation with the astragalus and forces it backward against the os calcis, tearing this also free. The foot is thus displaced backward on the leg. In the other case the mechanism is much the same, but the foot is forced forward. If the strain is very great the astragalus may be torn from its articulation with the bones of the leg at the same time.

Morian states that the dislocation is rare, but may occur forward or backward or to either side. It may be due to direct or indirect trauma, usually the latter. The symptoms are characteristic. There is increase of the plantar arch behind, and flatfoot in the anterior half of the sole. Supination near the heel gives place to pronation near the toes. The inner border of the foot is shortened. Power of abduction and adduction are lost entirely, and flexion partly. The toes are in overextension and motion of them is limited and painful. Pain is located at the head of the astragalus, which can be felt on the dorsum of the foot. The weight can be borne on the foot but not on the toe. Reduction is usually easy in recent cases. It may be done by drawing the anterior part of the foot forward, in a position of overextension, and applying a cast in a position of flatfoot. If reduction is not possible the astragalus should be resected, as interference with its blood-supply often leads to necrosis and may cause gangrene.

Luxembourg reports two cases. The first was a compound fracture in which the astragalus was so freed from all surrounding structures that it was thought best to resect it. The ankle is now almost stiff, but bears the weight of the body without discomfort. The other case was a partial dislocation with fracture of the neck; the head was excised and a plaster cast applied. The final result was good.

UMBILICAL HERNIA — STRANGULATION OF INTRA-ABDOMINAL GUT.

A peculiar case is reported by LORENZ (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 2), who was not able to find described one exactly like it.

The patient had an umbilical hernia of several years' standing, and was suddenly attacked by pain in the hernia and symptoms of ileus. The hernia was irreducible, but soft, and therefore not incarcerated. Occurrence of fecal vomiting determined operation. The sac contained a large amount of clear serum, a single healthy looking loop of bowel, and a round mass, which resembled a strangulated ovary. It was free at the neck of the sac, but con-

stricted immediately outside by passing through an abnormal opening in the omentum. The omentum was turned over, and it was seen that a spot or portion of mesentery belonging to a portion of bowel outside the hernia had been forced into the hole and was constricted. The opening was enlarged, and the corresponding bowel found free in the abdomen, with beginning peritonitis. The appearance of the gut improved so rapidly that the abdomen was closed. Recovery was perfect. The author suggests that this mesentery lay like an apron before the mouth of the sac, and was forced into it by a loop of bowel, which later escaped as the pressure increased.

DRAINAGE IN OPERATIONS UPON THE BILIARY SYSTEM.

LILIENTHAL (*New York Medical Journal,* May 18, 1907) says that despite the earnest work of numerous surgeons the surgery of the biliary tract is in an unfinished state. The number of deaths in uncomplicated cases is still great. The impressions recited by the author are based upon more than three hundred cases of nearly every known variety. He has reached the conclusion that in obstructive jaundice, especially the chronic variety, the skilful employment of biliary drainage is the most essential measure in reducing operative mortality. The longer the jaundice has existed the greater must be the caution in relieving the condition. Chronic obstruction leads to secondary cirrhosis of the liver with its attendant dangers, not the least of which is hemorrhage; also long-continued blocking of the liver may be followed by reflex suppression of bile consequent upon surgical drainage through its duct, with death from cholemia. The sudden relief of a liver tremendously engorged by long-continued common-duct obstruction has led to death from shock. In chronic profound obstructive jaundice the proper method of procedure would be to secure drainage of a gradual character. If the size and condition of the gall-bladder permits, a simple cholecystostomy should be performed as a temporary measure, making the stoma very small so as to prevent the too sudden relief of pressure. The operation for radical cure should be postponed until the conditions have become favorable. Great caution should be exercised to prevent adhesions which might embarrass the operator at the subsequent step. Gauze packing should be dispensed with, and the parts should be handled gently with rubber gloves.

FRACTURE OF THE SCAPHOID.

This fracture is fairly common, but was not often recognized before the introduction of the *x*-ray. The other bones of the carpus are very rarely broken. Several cases with radiograms are given by HIRSCH (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvi, 2).

There are two forms: (1) Intracapsular, across the middle of the bone at right angles to it. This shows little or no tendency to heal by bony union, and leads either to a false joint in the middle of the bone or interferes with the motion of the wrist. It may even lead to a sort of arthritis deformans. (2) Splitting off of the tuberosity by traction on the ligament from the styloid process of the radius. This is extracapsular and heals by bony union. The fracture is usually caused by a fall on the hand stretched out, in ulnar flexion or in radial flexion, with the fingers spread apart. The symptoms are not diagnostic, with the exception of *x*-ray examination, which with the hand in extreme ulnar flexion will show the fragments separated. The usual symptoms are swelling of the wrist, most marked on the radial side, limited motion of the wrist, especially of dorsal flexion (diagnosis from sprain), and tenderness in the "snuff-box" between the tendons of the extensors of the thumb. The "snuff-box" seems to be filled up, and the branches of the radial artery are plainly felt in it. If the surgeon's thumb and forefinger are placed on the palmar and dorsal surfaces of the scaphoid, and the injured hand placed in ulnar flexion, a point of tenderness will

be found at the bottom of the space. Crepitation is rarely elicited.

The symptoms of an old ununited fracture are similar. The hand is kept in radial flexion, and the wrist is quite stiff and painful on motion. There is the same tenderness in the "snuff-box." After slight traumatism there may be acute attacks of pain in the wrist with swelling and disability, the condition gradually returning to the latent state if the joint is not used.

The treatment of fracture of the tuberosity is the application of a splint with the hand in radial flexion; immobilization for two to three weeks. Fracture of the body does not heal in a splint, so an effort must be made to preserve a useful wrist by producing a painless false joint between the two fragments. Cold and massage, with temporary extension, will help this. If this is impossible, or if the fragments are widely separated, it is best to expose the bone by a long incision in the "snuff-box" and excise the radial part. This should leave a useful joint.

THE SURGICAL TREATMENT OF TRIFACIAL NEURALGIA.

F. MARTIN (*Annals of Surgery,* May, 1907) reports eight cases of trifacial neuralgia treated by resection of the Gasserian ganglion. Six cases were entirely cured without any operative complication; one died from pneumonia on the fifth day after operation; and one died the morning after operation from shock due to hemorrhage excited in the course of the operation. It has been the author's experience that recurrence follows all peripheral operations. In some of his cases of removal of the Gasserian ganglion the operation has been so recent that he is unable to predict whether or not cure will be permanent. It seems pretty well settled that permanent cure results from removal of the entire ganglion. The great drawback to the advancement of the operation is the high mortality attending it. The key-note to the success of the operation is the avoidance of hemorrhage; this is at times exceedingly difficult. The operation is one which requires all the dexterity a skilful operator can possess, nor is he justified in demonstrating it to a class, for in doing so he increases the risk of hemorrhage and endangers the patient. The division of the sensory root back of the ganglion is the most important step in the operation.

LESIONS ASSOCIATED WITH GUNSHOT WOUNDS OF THE STOMACH —TREATMENT.

W. MARTIN (*Annals of Surgery,* May, 1907) says that a classification which groups under the title of gunshot wounds of the stomach a case, for example, in which the bullet has passed through the diaphragm, the lung, the stomach, the transverse colon, and has remained embedded in the pancreas, is unsatisfactory, for the fatal outcome in such a case is no more due to the stomach injury than to the lesions in the other organs. The author reports two cases of his own and reviews the literature of the subject. He concludes that the complicating lesions are in most instances of graver importance than the gastric injury, and that to speak of the high mortality of gunshot wounds of the stomach is misleading. In any gunshot wound it is the sum of the injuries inflicted on the different organs and structures which is responsible for the gravity of the condition. To-day when it is the rule to operate immediately, there is little opportunity of making an accurate diagnosis of the organs injured; one cannot wait for the vomiting of blood, or even for the onset of rigidity in the abdomen. The situation of the small perforating wound furnishes the only guide. If this is over the area of gastric vulnerability, extending on the left side from the level of the fifth rib in the mammary line to a line passing through the extremities of the tenth rib anteriorly, and from the eighth rib in the scapular line to the level of the spinous process of the second lumbar vertebra posteriorly, then one may expect a number of important organs and structures to be wounded; and it seems of practical advan-

tage to think of the injuries recorded in similar cases.

In an operation undertaken for a wound in this area it is necessary to think of all the structures likely to be injured, and to be prepared not only to suture a wound in the stomach, but to treat any of the associated injuries. A reduction in the fatalities should go hand in hand with the recognition and treatment of these complicating lesions. In the twenty-five cases tabulated this is clearly shown. In most of them there were associated injuries of graver significance than the stomach injury; in two, splenectomy was performed; in two, thoracotomy as well as laparotomy; in five, the diaphragm was sutured; in one, the twelfth rib was removed and a wound in the kidney packed; in another, the gall-bladder was excised. There were six deaths and nineteen recoveries, or a mortality of less than 25 per cent. Most of the cases were operated on within a few hours of the receipt of the injury, the longest interval being eighteen hours. In this instance the patient recovered. This mortality represents, not deaths occurring from gunshot wounds of the stomach, but those resulting from injuries inflicted by bullets passing through the area of gastric vulnerability.

STAB WOUNDS OF THE HEART.

HARTE (*Annals of Surgery*, May, 1907) states that the old belief that all wounds of the heart are necessarily fatal has been disproven. It is the consensus of opinon among experimenters that the heart after being exposed can be grasped with the hands or forceps and gently compressed with no appreciable effect upon its action, that punctures with knife or needle produce only a temporary irregularity in the heart's action; that wounds produced during systole bleed more than those occurring during diastole; that wounds of the ventricle produced during systole are larger than those produced during diastole; that oblique wounds bleed more than perpendicular wounds; that wounds of the right ventricle are more dangerous, because of the thin ventricular wall and because the blood in the right heart coagulates more slowly; that wounds of the heart heal kindly, and that the cicatrix is complete in two weeks; that interrupted sutures are better than continuous ones; that the material enclosed in the grasp of the sutures undergoes atrophy and is replaced by scar tissue; that superficial stitches are less liable to tear out than deeper ones, and that the stitches should be inserted and tied during diastole, because of the danger of tearing out during systole. Some of these opinions are of practical importance, while others are theoretical and impossible to carry into effect. In penetrating wounds of the heart, if there be no surgical intervention, the individual will die from anemia, compression of the heart, or, later, from sepsis or functional incompetence. Many cases which succumb in a short time would recover if they could have prompt surgical aid.

In operating an anesthetic is imperative. Except when the patient is unconscious ether is the best anesthetic. Preparations should be made beforehand that the operation may be done quickly, as time is an important factor. If possible the incision should be so planned as not to involve the pleura. The formal osteoplastic flap is liable to result in injury to the pleura. Two or more costal cartilages and, if necessary, a portion of the rib can be divided and reflected back over the sternum. With care the pericardium and pleura can be separated from the overlying structures and the pericardium opened without injury to the pleura. Loose blood and clots should be sponged out, when usually the bleeding point can be seen or felt and bleeding controlled by pressure until sutures can be introduced. The best suture material is fine chromicized catgut introduced with a sharply curved needle. Each stitch should be left long after tying as the ends assist as tractors. The heart's action is very erratic and rapid, and the stitches are difficult of introduction. In wounds of the ventricle the stitches must be introduced deeply to insure approximation. In the case of the auricle through-and-through sutures are

imperative as well as several superficial ones. Everything should be sacrificed to secure exact approximation. No harm results from catching branches of the coronary artery in the sutures. The pericardium should be closed with continuous catgut suture without drainage. If the lung is collapsed, the pleural cavity should be cleared of clots and provision made for drainage at a dependent portion of the chest, provided the condition of the patient permits. When the heart has lost the support of the lung its action is very violent and irregular. This can be overcome by packing gauze pads wet with normal salt solution into the pleural cavity to give support to the heart. The after-treatment is routine, in which small doses of morphine may be used with advantage.

Harte reports the case of a man with a stab-wound of the left auricle which he sutured. The pleura had also been opened by the injury and the lung was collapsed. The patient developed empyema a few days later, and finally died of this condition nearly a month after the receipt of the injury. Autopsy showed that the heart wound had healed, and the endocardium and valves were normal.

TREATMENT OF A HEMOPHILIC KNEE-JOINT BY OPERATION AND THYROID.

RUGH (*Annals of Surgery*, May, 1907) reports a case of hemophilic knee-joint treated first by incision under the supposition that the trouble was inflammatory, and later successfully by thyroid extract after other remedies had failed. The patient was a man, aged twenty-two years, who had had for ten years recurrent attacks of swelling and pain of the left knee, usually following slight traumatism, and incidentally free bleeding from bites of the tongue or from the nose. After treating the joint by ointments and casts for a time without good results incision was made on the inner side of the joint, and it was found that the tissues were blood-stained and the synovial fringes were hypertrophied and softened as in hemophilia. There was not much bleeding at the operation, but on dressing the wound on various occasions subsequently bleeding was very profuse. Treatment was carried out by means of calcium chloride, gelatin, and adrenalin without any good effect, except that when gelatin was given the blood which poured out coagulated very rapidly and firmly. The patient meanwhile became very anemic. Finally thyroid extract was given in doses of 5 grains each three times a day. The good effect was noticed at once by lessening of pain, which had hitherto been severe, and diminution in loss of blood. In eight days bleeding had ceased, and the condition of the blood had greatly improved. For the past five months the man has been at his usual occupation without any recurrence.

REVIEW OF A RECENT SERIES OF OPERATIONS UPON THE STOMACH.

BREWER (*Annals of Surgery*, May, 1907) reports the results of seventeen gastric operations recently performed in his service, sixteen by himself and one by another surgeon, for conditions thought before operation to be chronic gastric ulcer or benign stenosis. The first group numbers twelve cases, and consists of those in which a definite anatomical lesion was demonstrated. Eleven of these recovered, and one died on the sixth day of pneumonia. Of the eleven which were immediately relieved of their symptoms, nine are known to have remained well, one died six months later, probably of malignant disease, and one other continues to suffer and lose weight. In all cases in this group operation was clearly indicated. In all the gastroenterostomy cases the posterior no-loop operation was performed, and in ten of the twelve the suture method was followed. In no instance was there any functional disturbance due to side-tracking the duodenum. In no case was there any evidence of sepsis or peritoneal irritation, and none of the cases showed postoperative shock. In the only fatal case of the series a severe hemorrhage occurred in the stomach immediately after the operation. This soon ceased, but

on the fourth day the patient developed an extremely toxic lobar pneumonia and died in forty-eight hours.

The second group of cases numbers five, and consists of those in which no lesion was found. One of these was at once relieved of a hysterical pseudotetany, one died from persistent vomiting, one continued to suffer from the gastric crises of locomotor ataxia, and two from symptoms which could only be classified as a gastric neurosis. The author does not attribute the improvement in two of the cases to the operation, and considers both to be failures from a surgical point of view. Taken as a whole, this series teaches that if one would obtain the best results in this class of patients he should limit his operative intervention to cases in which the evidence of a definite anatomical lesion is well-nigh conclusive.

A REVIEW OF RECENT NEUROLOGICAL SURGERY.

ARMOUR (*The Practitioner,* May, 1907) quotes at length Cushing's paper concerning surgical intervention for the intracranial hemorrhages of the new-born. This paper, dealing particularly with the so-called birth palsies, points out that the hemorrhage is usually of venous origin and follows the rupture of some of the delicate and poorly supported radicles of the cerebral cortex. It may be due to great trauma or to a strain upon the vessels by the venous stasis of postpartum asphyxiation. The vessels most likely to be ruptured are those which ascend over the cortex and enter the longitudinal sinus in the midcerebral region. Those veins, which lie in the subarachnoid space and for the most part are protected from rupture by following the sulci as they ascend toward the middle line, leave this protection when near the vertex, and, apparently with no support whatever, cross the subdural space to enter the dura at the outer edge of the sinus. In infants these unsupported vessels are the only connection between the leptomeninges of the hemispheres and the dural sheath underlying the sinus.

Although the cranial molding may take place to a considerable extent without putting any great strain on these lateral cerebral veins, any undue overlapping could readily tear one or more of them away from the sinus. In this way Cushing accounts for the fact that the primary effusion, and therefore the thicker portion of the clot, is commonly median, and implicates primarily and most seriously the centers for the lower extremities. The extravasation he holds is usually limited to one side, though it may be bilateral, nor should the condition be difficult to diagnose. Should there be any serious doubt as to the actual nature of the lesion it might be decided by lumbar puncture, when free corpuscles will be found in the fluid of the lumbar meninges. This would serve to differentiate between hemorrhagic and infectious cases, where diagnostic difficulty is present. A history of difficult labor or of postpartum asphyxiation has an important bearing upon diagnosis. Among the objective signs is bulging of the fontanels—indeed, they may be so tight as to show no pulsation. Convulsions are frequent, and if they do not appear for several days after birth may be unilateral. There may also be an undue reflex activity, the child starting or twitching in a convulsive way in response to any sensory stimulus. Ocular palsies or inequality of the size of the pupils are not uncommon. Medullary symptoms are sometimes observed, such as alterations from the normal in the cardiac and respiratory rhythms. Evidences of paralysis are rare. According to Gowers two-thirds of the cases exhibit in their terminal aspects epilepsy, even when their intelligence does not suffer. Convulsions are often Jacksonian in character, akin in all respects to those which follow the cortical changes resulting from criminal injuries with hemorrhage in adult life.

Cushing's report covers four cases. He raised an osteoplastic flap, including the entire parietal bone, exhibiting a plum-colored dura which on being opened disclosed a clot. This was lifted off in large pieces from the exposed area of the cortex, and a considerable quantity of clotted blood,

which extended over the frontal and occipital regions, was irrigated out with warm saline solution.

In another case the operation was done on both sides. Cushing believes that a newborn child, with a proper regard for hemostasis and careful avoidance of exposure, will stand a cranial operation well. He notes that coagulation time is as rapid as in the adult, and holds that since the operation of craniectomy in the newly-born child is comparatively free from the immediate risk of death the procedure is well worth adopting, in view of the crippling later consequences of meningeal birth hemorrhages.

Armour further quotes Sachs's paper on "Indications for Operative Treatment in Serious Head Injuries," giving as a contribution to modern cerebral surgery this illuminating sentence: "If the external evidence points to one side and the symptoms to the other, consider both, take the side of external injury first, but try to reach the other as well."

Bullard is further quoted to the effect that operation should be performed in adults whenever the unconsciousness, after severe head injury, lasts more than twelve hours, and when it seems clear that the unconsciousness is due to an injury and not to alcohol or other causes, or complications. He admits, however, that this rule is not universal, while Walton is of the opinion that the following symptoms in themselves are not sufficient to justify operation: (1) Continued unconsciousness, not deepening; (2) paralysis appearing immediately, and not increasing; (3) inequality of pupils; (4) delirium and restlessness; (5) the presence of fever. Among the conditions indicating operation he included: (1) Deepening initial unconsciousness, or unconsciousness coming on after an interval, and deepening into coma; if no other localizing sign accompanies, the seat of injury should be chosen for operation. (2) The spread or increase of initial paralysis after an interval. This points to hemorrhage. In the presence of this condition, the possibility of bruising and edema alone being present does not suffice to contraindicate operation. (3) Jacksonian attacks. (4) Dilated pupil on one side, accompanied by paralysis or spasm upon the other (middle meningeal hemorrhage). (5) Punctured or definitely depressed skull. (6) The question whether simple fissures and moderate depressions of the skull require operation demands surgical rather than neurological judgment. The benefit of the doubt should be given to operation, in view of the many cases in which exploration of such injuries reveals wide-spread and serious conditions likely to prove a future menace.

FRACTURES ABOUT THE ELBOW-JOINT.

CARLESS (*Practitioner,* May, 1907) describes three chief forms of transverse fracture at the lower end of the humerus. The one, supracondyloid, may occur in children or adults as the result of falls on the elbow, or indirectly as the result of falls upon the outstretched hand whilst the elbow is bent. The displacement is usually backward. In this fracture two points need notice: first, that the line of the lesion is well above the joint, and, therefore, passive and active movements are not necessary at as early a stage as if the joint were involved; and secondly, that the internal angular splint is a very inefficient contrivance for treatment. Replacement is usually easy, being accomplished by bending the arm and making traction upon the hand, whilst the olecranon is pushed downward and forward by the thumbs. Carless prefers a posterior poroplastic or plaster-of-Paris gutter splint, which is molded to the limb, and a short anterior splint may be conjoined.

Operation is seldom required in uncomplicated cases. When the fracture is complicated by vertical cleft, or split in the shape of a T or a Y, displacement does not necessarily ensue if the periosteal flap be not torn. If, however, this be badly lacerated there may be displacement inward and outward and some displacement of the elbow may result. A case of this sort should always be submitted to operation

in order to fix the fragments one to the other, even if it be unnecessary to secure the united fragments to the shaft. The introduction of a screw through the fragments will suffice to fix them satisfactorily, when flexion to a little more than a right angle and the use of anteroposterior splints will suffice to bring the case to a satisfactory conclusion. In other cases the comminution of the lower end of the humerus may be more extensive, and, indeed, it may be crushed into fragments. Even if such a condition exist union will occur, but it will be associated almost certainly with the development of much callus, which will obliterate the olecranon and coronoid fossæ, besides being accompanied by intra-articular adhesions of such a character as to interfere permanently with the movements of the joint. It is probable that subperiosteal resection of the lower end of the humerus will be the best treatment that can be adopted, if it be found on exploration that the fragments cannot be satisfactorily fixed to one another by screws, nails, or pegs. Carless notes that the recorded results of such operations have been encouraging.

The second form of supracondyloid fracture is seen in infants and young children, in the form of a complete separation of the lower epiphysis. Before the age of three years this fragment is purely cartilaginous and will include both condyles and epicondyles. The line of cleavage is well above the joint, so that the lesion is extra-articular. Radiography shows nothing excepting backward displacement of the ulna and radius.

Much commoner than this is the separation of the epiphysis in children. In it also the line of cleavage generally extends into the diaphysis on one side or the other, so that the lesion is partly a separated epiphysis, partly a fracture. The obliquity in this fracture is almost always downward and forward. In spite of the encroachment of the diaphysis the general features of the epiphyseal separation are largely maintained. Thus the periosteum remains firmly attached to the epiphyseal cartilage, but is stripped off the diaphysis for a considerable distance upward, and in the cavity thus formed blood collects, constituting an important element in the swelling which almost always follows this injury. The displacement is generally backward, but occasionally forward. The elbow-joint itself is rarely involved in this lesion, though in older children it is more liable to injury than in the younger, owing to the downgrowth of the diaphysis on the inner side, whereby the internal epicondyle is separated from the rest of the epiphysis.

Carless has not the slightest doubt that the position for the treatment of these cases is one of acute flexion, one reason for which is that the slight limitation in extension is a less serious sequel than impairment in the power of flexion. There are certain cases which can be readily reduced into position with or without an anesthetic, with which full flexion can be easily secured. Reduction is accomplished by traction made upon the forearm, which is gently but forcibly bent, whilst pressure upon the olecranon forward and downward carries the fragment into place. The forearm is flexed acutely with the hand supinated, and is bandaged to the arm so that the hand is approximated toward the shoulder. After its fixation in this position rotation inward from the shoulder may be allowed, and the arm then bound to the side. The adoption of this procedure prevents the development of the ugly gun-stock deformity. The arm is kept in this position for twelve or fourteen days, and then placed in a hollow paroplastic gutter splint, hinged at the elbow in such a way as to reproduce the carrying angle. The amount of movement is graduated by tapes passed through holes on either side of the upper and lower segments, the range of movement is gradually increased, and in this way it is possible to gain excellent functional results.

When the case is not seen until considerable swelling has taken place, it is often impossible to effect reduction, and the adoption of the acutely flexed position is impracticable. Under such circumstances

the operative treatment is desirable. The surgeon should cut down to the site of fracture on either side, dividing the periosteum, so as to allow the blood collected beneath it to escape, and should then manipulate the fragments into position, and put the limb up in acute flexion. Difficulty at times arises owing to the irregular edges of the fragment, and in some cases it may be necessary to clip off projecting spicules of bone. This is to be avoided if possible, as the irregularities help to maintain the fragments in position, when once the displacement has been overcome. After reduction the adoption of the acutely flexed position usually suffices to maintain apposition, and the introduction of retentive appliances, such as wire or screws or nails, is generally superfluous. The lateral incisions are closed by a stitch or two, and the limb is put up in the usual way. The bad results of imperfect treatment are summarized by Carless as follows:

Limitation of movement may involve either the hinge action of the elbow or the rotation of the superior radioulnar articulation. It may arise from the presence of intra-articular adhesions, fibrous or osseous; from the filling up of the olecranon or coronoid fossæ by callus; or from the actual displacement of bony fragments.

Non-restoration of the carrying angle is a result which is often seen and cannot always be prevented. The result may be that the forearm and arm are quite straight in the same axis, the so-called "gun-stock deformity," or there may be a definite angular deformity, known as cubitus varus, or valgus, as the case may be.

Cubitus valgus is to be looked on as an exaggeration of the normal carrying angle. It also usually results from imperfect treatment of an epiphyseal separation involving the lower end of the bone. The dependence of these two deformities upon such transverse lesions is emphasized by Cotton, who investigated the origin of a considerable number of them. In the valgoid condition the chief trouble often arises from the fact that the inner condyle is unduly large and prominent, and carries with it the ulnar nerve, which is thereby exposed to injury. A case of this sort came under the notice of Carless not long ago suffering from traumatic neuritis, which was recurring constantly as the result of slight injuries.

Imperfect development of the bones may result from these epiphyseal lesions if they are not correctly restored to position.

Paralytic conditions, resulting from nerve lesions, are also not unknown. The ulnar nerve is exposed to injury in any fracture which involves the inner condyle, whilst the displacement backward of the lower fragment causes undue pressure anteriorly by means of the lower end of the shaft, and the median nerve may be thereby involved. Mühsam has laid stress on these lesions in a recent communication (*Centralblatt für Chirurgie,* 1906, No. 32, p. 877).

The so-called ischemic contracture is also occasionally seen to follow these lesions, but it must be clearly understood that it is not due to nerve pressure or to splint pressure, but, as originally described by Littlewood, of Leeds, is due to an intrinsic shortening of the muscles of the forearm resulting from a fibrosing type of myositis. A case of this type was seen by Carless a little time since, in which no splints had been used which could exercise pressure upon the forearm.

Fracture of the external condyle is an injury which Carless believes requires early operation to gain good results. The outer is the one more frequently involved as the result of direct violence. The line of fracture runs into the elbow-joint, reaching it between the trochlear surface and the capitellum; the fragment thus detached is drawn slightly downward and rotated forward by the muscles attached thereto. Crepitus can generally be obtained without much difficulty, but the arm becomes rapidly swollen, so that reposition without an operation is almost impossible, though acute flexion is the position which most encourages this. Imperfect union leads to modification of the carrying angle, but

chiefly to imperfect flexion of the joint, owing to the anterior projection of the fragment. By means of a curved incision over the condyle the bony fragment can be exposed and brought into perfect apposition and secured by means of a screw. Fractures of the internal condyle and the trochlear surface are much less common; the fragment generally travels backward and upward, possibly a little inward, carrying the ulnar and articular with it, thus producing angular deformity. On theoretical grounds this fracture also should be treated by open operation.

Separation of the internal epicondyle is comparatively frequent. Usually it is displaced downward, owing to the drag of the muscles arising from it. Direct treatment is by operation. A small incision will enable the fragment to be apposed to the shaft; and then it is easily fixed by the introduction either of a nail or of a screw.

As for fracture of the olecranon, there is only one way of dealing with these injuries when the periosteal, tendinous, and fascial tissues are involved to such an extent as to allow of complete separation of the fragment, and that consists in operation. The fracture is usually transverse and situated near the base of the process; should there be no separation, immobilization for a week or two to allow the parts to settle down, and then massage and passive movements to commence with, and subsequently active movements, will suffice to obtain an excellent result. No splints are required, but the arm should be kept in a sling for a while.

When there is distinct separation union by silver wire is indicated. Thereafter full range of movement is practiced at the end of fourteen days.

Fractures of the head of the radius also require operation in order to secure favorable results if there is any separation of the fragments. Fissures of the bone can usually be left, and treated by massage and early mobilization; but if the head is comminuted, or when it is separated either by a transverse or a vertical fissure, then the only chance of preservation of the function is by operation. It may be possible to fix the fragments into position by silver wire. In the majority of cases excision of the head will be required. Even if the fragment has been wired, there is often a great deal of reaction and some development of callus, which interferes with union.

ABSCESS OF THE MESENTERIC LYMPH GLANDS.

BAYARD HOLMES (*Chicago Medical Record*, May 15, 1907) notes that secondary infection from the mesenteric lymph gland and its ultimate extension or rupture into the peritoneal cavity must be considered, in summing up the etiology of peritonitis either limited or diffuse. He states that there are two distinct clinical conditions which give rise to suppurative adenitis. In the first instance the adenitis is the result of a suppurative process primarily in the appendix, the gall-bladder, or some part of the genito-urinary tract. In the second instance it is a complication of typhoid fever, resulting either as a typhoid mixed infection adenitis or as an adenitis due to the typhoid germ itself. The production of a suppurative adenitis is not different from that in the groin or axilla. The treatment in case of rupture is by prompt laparotomy and drainage.

OPENING THE CRANIAL CAVITY FOR THE REMOVAL OF TUMORS.

FRANK (*Chicago Medical Recorder*, May, 1907) prepares patients for one or two days by the administration of bromides. He shaves not only the scalp but the eyebrows. He prefers chloroform as an anesthetic, but wisely advises against the use of any if the patient be in a comatose condition. He gives ¼ to ½ grain of morphine half an hour before operation. He states that as a rule Esmarch's constrictor is not necessary for the temporary control of hemorrhage from the scalp. As to the method of opening the skull he states that the use of the trephine while

possessing some advantages had in its field of usefulness become very limited owing to newer methods. The chisel and mallet meet with his unqualified indorsement. Frank's advice will be appreciated when it is stated that the incision of the scalp should be so planned that when the flap is made it should point in a downward direction to facilitate natural drainage, and that the division of large blood-vessels should be avoided, if possible.

With the former of these two recommendations the need of retaining the vitality of the large flap will sometimes interfere.

PEPTIC ULCER FOLLOWING GASTRO-JEJUNOSTOMY.

HAMANN (*Cleveland Medical Journal*, May, 1907) records the case of a man, forty-eight years old, who because of symptoms of gastric ulcer was subjected to an anterior gastrojejunostomy and also an enteroenterostomy, the junction between the two limbs of the intestinal loops being made about four inches below the stomach. A Murphy button was used in both anastomoses, and reënforcing sutures of silk. The twenty-first day after operation this patient complained of epigastric pain, and on palpation an indistinct mass could be felt in the epigastric and left hypochondriac regions, which was tender upon pressure. Three days later he went home, his symptoms not being at all violent, and two days later he died quite suddenly, in the absence of alarming symptoms. Indeed, the day preceding his death he felt well.

Autopsy showed perfect union between the intestine and stomach and the button *in situ*, and an ulcer of the jejunum just beyond its junction with the stomach, but in such position that it could not have been caused by pressure of the button. There was general peritonitis, and remains of food were found in the peritoneal cavity. The gastric mucosa presented lesions which had been called erosions, no distinct round ulcer being present.

Hamann quotes Gosset's collection of thirty-one cases of peptic ulcer following operation. Twenty-nine of these occurred in males. The time at which the ulcer appeared, or rather its symptoms developed, varied from ten hours to seven years. There were ten deaths and nineteen recoveries; in two the results were not stated. All these cases of peptic ulcer followed operation for benign diseases. Of twenty-one of the cases in which these observations were made there was hyperchlorhydria in seventeen.

Tiegel has classified the cases of peptic ulcer into two groups: First, a group in which there are no symptoms at all until perforation takes place; thereupon, without any prodromes, the familiar evidences of peritonitis. Secondly, a group in which after a shorter or longer interval of health after operation the symptoms of gastric ulcer appear; there are also signs of adhesive peritonitis, the anterior abdominal wall becomes infiltrated, and an indistinct mass can be felt. To this group most of Gosset's cases belong, and it exhibits a lower mortality than the first group.

The treatment of peptic ulcer following gastroenterostomy is based on general principles applicable to treatment of ulcer of the stomach.

EARLY ASPIRATION IN PLEURISY WITH EFFUSION.

YARIAN (*Cleveland Medical Journal*, May, 1907) holds that aspiration of pleuritic effusions is better done early than late; that local measures, internal medication, and all other temporizing means are really of secondary importance except in the smallest collections of fluid, or those which are not accompanied by symptoms of any importance and which yield readily to other treatment. He quotes, as fully expressing his views, from Forchheimer to the effect that the only local measure which fulfils all the indications required for pleurisy with non-purulent effusion is the operative removal of the fluid. In all cases of primary pleurisy it is always indicated. It matters not whether the fluid has reached the tip of the first rib, whether the patient is in immediate danger or not. In secondary pleurisy the vital indication

may be looked into for surgical intervention; but especially in the latter stages of myocardial insufficiency should the fluid be removed from the chest immediately after its presence is detected.

Dieulafoy could find no case of death after aspiration in which not more than 1200 cubic centimeters was withdrawn at one time, from which he argues that not more than 1000 cubic centimeters should be removed through a small needle with very little negative pressure in the bottle. He puts his patient in the recumbent or semi-recumbent position, and ceases withdrawing the fluid when the symptoms of faintness come on, repeating the procedure if necessary for the complete emptying of the chest.

SOME SURGICAL ASPECTS OF EMPYEMA.

LUND (*Boston Medical and Surgical Journal,* April 18, 1907) says that the belief that a pneumococcus empyema will get well with repeated tappings and does not require rib resection has, with numerous other fallacies regarding the treatment of empyema, been exploded. There is every reason for early operation in all forms of empyema. In the first place, the patient is usually attacked by the disease directly on the heels of a severe and exhausting pneumonia, and is in no condition to stand the drain of a long-continued infection; in the second place, every day that passes after the development of pus in the chest exhausts the patient by the absorption of toxins; in the third place, the lamentable accident of bursting into a bronchus is, as time goes on, increasingly likely to occur; in the fourth place, in case the abscess becomes walled off and the toxic absorption is thereby lessened, those very protective adhesions, while admirable for the purpose for which they are intended, as they become firmer with time and more completely organized, serve in a most efficient manner to prevent expansion of the compressed lung after the chest is opened. All this takes no account of increasing embarrassment of the respiration and heart's action which accompanies the filling up of the pleura with pus, and the danger that long-continued compression of the lung may so consolidate it as to permanently obliterate many of the air cells and put an end to the possibility of expansion.

In establishing a diagnosis by means of the needle one should not be satisfied if the first attempt brings no pus, but the needle should be inserted in different directions or even at different places. The writer believes that the best point for tapping as well as for resection is at the eighth rib posteriorly just outside the angle of the scapula, with the arm by the side. The chest will drain better at this point than anywhere else. The interspaces are narrower here and the rib thicker but even, so the operation of resection is easy enough. But little preparation of the skin is needed. Local anesthesia will answer, but general anesthesia with ether very carefully given on the operating table, with the patient in the position desired for operation, is preferred.

All preparation for operation should have been made before the anesthetic is started, so that it may be done quickly. About three inches of the eighth rib is removed at the site referred to, after carefully stripping off the periosteun. Then an incision one inch long is made in the pleura, and this is enlarged with the fingers so as to correspond in length with the piece of rib removed. This being done the anesthetic is stopped. The hand should control the outflow of pus so that it may not be too rapid. The finger is introduced into the cavity and any masses of fibrin removed. The best form of drainage tube is a piece of rubber tube one-half to three-fourths inch in diameter with a hole cut in the side and doubled at the point where this hole is. The tube should be just long enough to reach to the inside of the chest wall, and should be securely fastened to the skin to keep it from slipping in. The tube drainage should be kept up until the cavity within the chest has become very small. This may require only a short time, or perhaps months. The au-

thor has used irrigations of the chest in a number of cases and has never noticed any bad results therefrom.

Nursing does much for or against these patients. They should sit up in bed from the first, because in the sitting position drainage is better and respiration easier. They should be taken into the fresh air and sunlight as soon as possible. The use of respiratory measures to promote expansion of the lung, especially the blowing of water from one bottle into another through a tube, is very valuable.

TREATMENT OF THE TYPHOID SPINE.

GIBNEY (*New York Medical Journal,* April 20, 1907) states that he has had fairly good results in the treatment of typhoid spine in a reasonable length of time by resorting to fixation of the column, avoidance of trauma, the free use of the Paquelin cautery, and the subsequent employment of massage and graded exercises. The value of the cautery as a counter-irritant has proved so great in the writer's hands that he feels justified in recommending it above all other counter-irritants. The plaster-of-Paris jacket or corset has not proved so valuable an agent as has the simple Knight spinal brace or the posterior spinal assistant of Taylor. The crisscross strapping with zinc oxide adhesive plaster has been a valuable adjunct, especially in the milder forms of this disease. Potassium iodide has been given in certain cases, but not with any definite results. Where deformity exists, as it undoubtedly does in certain instances, it is necessary to wear apparatus for longer periods. The Paquelin cautery is insisted upon as a regular line of treatment as long as tenderness and pain on movement exist. Even after all tenderness subsides it is a good plan to employ the cautery occasionally, say once a week or once a fortnight. It has been shown that even these deformities and areas of infiltration, bony or muscular, disappear after a while, and fortified by this assurance the surgeon can decide when to begin the convalescing part of the treatment, namely, douches, hot baths, and systematic graded exercises, the object of which is to correct the stiffness developed in the muscles which have been for a time out of commission, and to restore the tone generally to the spinal column.

Nothing has been said thus far about anodynes and hypnotics. The histories of many of the cases now on record show that these are often necessary, even to the administration of chloroform. The writer does not recall any instance where the drug habit has been acquired. The administration, therefore, of hypnotics must be left to the individual practitioner with the suggestion that, if the aforesaid treatment by fixation and cauterization is carried out, hynotics will not be in great demand.

SURGERY IN DIABETES.

WIENER (*Medical Record,* May 4, 1907) deals exhaustively with the question of performing surgical operations in diabetic subjects. In diseases which arise during the course of diabetes but independently of it, and which require surgical interference, there should be no hesitation about operating, for the wounds will heal and the mortality will be but little different from that seen in non-diabetic patients. When the surgical condition is a result or complication of diabetes, the problem is a much more serious one. The principal dangers to diabetics under surgical procedure are the anesthesia, infection, and hemorrhage. Ether and chloroform should be avoided as much as possible. Nitrous oxide, spinal anesthesia, and local anesthesia should be chosen where possible. The dread of operation and loss of fluid by preliminary purging and fasting contribute to the intercurrence of coma in diabetic patients operated upon. Asepsis should be most rigid, and antiseptics should not be allowed to come into contact with the wound, as they still further lower the vitality of the tissues. In cases of abscesses, to which diabetics are prone, the rule should be early and free incision, as these patients endure suppurative processes very badly.

THE DRAINAGE METHOD IN THE TREATMENT OF ACUTE MIDDLE-EAR DISEASE.

While recognizing the fact that there is still an honest difference of opinion as to whether we shall try what is termed the irrigation method of treatment, or the simple drainage plan, WIENER (*American Journal of Surgery,* May, 1907) expresses his belief that it is to a certain extent possible by means of such a plan, based as it is upon sound and strict surgical principles, to avoid at times not only the persistence of suppuration in the middle ear, but also to reduce to a minimum the chances of more serious complications. The causes which contribute to the persistence of such suppuration within the middle ear are the smallness and unfavorable position of the perforation, if present, preventing the escape of the purulent secretion; the formation of exuberant granulations and polypi; retention and decomposition of the purulent secretion; the formation of adhesions and septa which may partition the ear into several spaces, retaining or enclosing part of the secretion and thus increasing or aggravating the disease; bad hygienic conditions, together with neglect of treatment.

Assuming that the diagnosis of acute otitis media has been confirmed, if the local and constitutional symptoms are of a mild character, relief or even an abatement of the inflammatory process can be obtained at times by the simple instillation of a ten-per-cent solution of carbolic acid in glycerin into the external canal. About ten drops of this solution is dropped into the canal and allowed to remain there for about five minutes, and the canal is then sealed with absorbent cotton. This procedure is repeated about every four hours. A two-per-cent solution of menthol in albolene often answers the same purpose.

When neither of these procedures gives relief, an occlusive wet dressing of a ten-per-cent solution of liquor Burrowii, including a strip of gauze moistened with this same solution placed within the canal and bandaged over the ear, should be tried. Such a dressing usually quiets the patient, and at the same time exerts an antiphlogistic action upon the inflamed surfaces. It will not obscure the clinical picture of the tympanic membrane, nor will it disguise any important symptom which may call for further interference. If within a period of twenty-four hours there is no improvement, and the pain, temperature, and bulging of the tympanic membrane assures us that the condition has become aggravated, then the time for a paracentesis is at hand, and we should not delay. If, on the other hand, the wet dressing does afford relief, and the appearance of the tympanic membrane shows an abatement of the inflammatory process, then the wet dressing should be continued for twenty-four hours. Thereafter the outer dressing should be replaced by a plug of cotton and the gauze within the canal kept moist with the ten-per-cent solution of aluminum acetate for thirty-six hours more, as is deemed necessary. The patient should be cautioned not to expose himself for about one week, after which the Politzer bag should be employed to establish a normal relation of the parts.

Should the case be one in which a paracentesis is indicated we should proceed in the following manner: First, in order that the operation may be properly performed, there must be a proper fixation of the head with good illumination. Therefore, whenever it is possible, place such patients under the influence of a general anesthetic. The operation is extremely painful, and it is almost an impossibility to fix the head and hold it firmly without the assistance of such an agent. In young infants and children, in whom it is difficult at times to obtain a proper view of the membrane, and in whom the insertion of a fair-sized speculum is painful, these children will squirm and twist so that it is quite impossible to place the incision accurately. Occasionally one will meet with a case in which a general anesthetic is contraindicated. Here the subcutaneous injection of cocaine and adrenalin, as practiced by Neuman in operations upon the middle ear,

will often answer the purpose. The injection is preceded by spraying the canal with chloride of ethyl. The writer has used this method in private and in clinical practice, but cannot recommend it as a routine procedure, as it too often fails to produce complete anesthesia.

For cleansing the external canal, a weak solution of lysol or a 1:500 solution of bichloride of mercury in alcohol will answer the purpose. It is well to remember that a thoroughly aseptic field in this region is an impossibility. After the cleansing process is completed, one should introduce under good illumination the largest size speculum that can be inserted without injury to the canal. One is now ready for the incision in the tympanic membrane. The instrument which the author prefers for this purpose is the sickle-shaped knife, mounted preferably in the straight handle. This permits of more delicate and direct manipulation than the knife mounted in the bayonet handle. The incision is made in the lower quadrants of the tympanic membrane, first of all because this region is practically the lowest point for drainage, and secondly, no harm can be done to the promontorial wall if it is abraded. On the other hand, an incision made too deeply in the upper quadrant posteriorly might disturb the ambo-stapes articulation, or in the hurry in which this operation is done, by one with insecure and unskilful hand, it may even do more serious damage. It may happen that the bulb of the jugular vein projects so far within the tympanic cavity that it may be wounded when the incision is made in the lower quadrants. Such an occurrence is so rare that the mere mention of this accident is sufficient. The hemorrhage which may ensue can easily be controlled by tamponing the canal. If any one portion of the tympanic membrane bulges considerably forward that portion should be incised.

If it is not possible to make the incision as described above, one should make a good-sized curved incision extending downward through the posterior quadrants. It is always better to make the incision curvilinear. In this way the edges of the wound are made to gape, due to contraction of the radiating fibers of the tympanic membrane, and thus the perforation remains open. After the incision, the canal should be carefully cleansed of blood and secretion. A piece of gauze rolled in the form of a lead-pencil, varying in thickness according to the size of the canal, should now be used as a drain. These drains are dipped into a ten-per-cent solution of liquor Burrowii and then introduced by means of a delicate forceps into the canal close up to the incision. The projecting end is coiled up within the concha. Over the entire ear and mastoid process a dressing wet with the same solution is placed and covered with rubber tissue, and a bandage is applied. This is allowed to remain for twenty-four hours. Such a dressing accomplishes two things: first, it acts as a drain, and secondly, it serves as an antiphlogistic measure.

In addition to the local treatment, the internal medication resorted to consists in a proper elimination of the contents of the bowels by means of calomel followed by a saline cathartic. After twenty-four hours the outer dressing is removed together with the drain, and the canal carefully wiped with a cotton applicator, which at first is used dry and then moistened with peroxide of hydrogen. In order to remove the secretion from behind the tympanic membrane, the author resorts to aspiration. He employs for this purpose an instrument which he recommended some time ago, but now uses with modifications which enable one to thoroughly sterilize it. It is practically a Siegel's speculum, but is manufactured after the pattern made by Windler, of Berlin. It is constructed so that it may be rendered thoroughly aseptic. One should not try to accomplish this delicate procedure by means of a suction syringe, which might do harm to the delicate structures of the middle ear. The aspiration is continued until the secretion has ceased to appear within the canal or assumes a pinkish hue. Should a drop of blood appear no harm is done, but to con-

tinue beyond this point only causes unnecessary pain, and nothing is gained except to close the perforation with a clot, which defeats the purpose of drainage.

After the aspiration is finished and the canal has been cleansed, the same dressing is applied to the ear and repeated daily three or four times, as is found necessary, until the very acute symptoms have disappeared. The outer dressing is then discontinued and replaced by the drain within the canal, and a piece of absorbent cotton within the concha. This cotton is changed by the patient during the following twenty-four hours whenever it becomes soiled. The canal is then cleansed thoroughly, and aspiration is resorted to once daily by the physician in charge. The strip of gauze within the canal is kept moist with a two-per-cent solution of boric acid, dropped thereon about every two or three hours by the patient or attendant. This serves the purpose of assisting the drainage and keeping the pus in more fluid condition.

As soon as the acute symptoms have subsided, inflation with the Politzer bag is resorted to. The benefit of this is soon apparent by the rapid restoration of the diseased parts to their normal condition. When the secretion has almost ceased, the gauze is discontinued and a very small amount of boric acid is blown into the canal. Almost within forty-eight hours thereafter one will find the canal dry.

In young children such a method of drainage has an especial advantage over irrigation of the canal. Irrigation is painful. The amount of persuasion necessary before it can be properly accomplished in young children, and even in adults at times, is sufficient to tax one's patience. In the majority of cases in which irrigation is used, just what is sought for is not accomplished. Such canals are always found filled with secretion when the time for the next irrigation is due, and soon an eczematous infiltration presents itself at the external orifice. Furthermore, no matter how bland the fluid is, if one will take the pains to observe carefully he will notice that instead of diminishing the edema within the canal, irrigation encourages it. Furthermore, it stimulates the growth of granulation tissue.

In regard to the use of the Politzer bag for inflation after the acute symptoms have subsided, the author has yet to observe the case in which this procedure has caused the slightest aggravation of symptoms. On the contrary, the patients will express themselves as feeling more comfortable. The rapidity with which the discharge lessens, as soon as one is able to resort to this procedure, convinces one of the rationale of this method. It is the only method which assists the Eustachian tube in getting rid of its secretion, and also that which remains in the tympanic cavity after aspiration. Such a tube filled with a stagnating secretion will often exert a baneful effect upon the tympanic cavity, unless properly cleansed. When there is a sufficiently large perforation in the tympanic membrane and the Politzer bag is used, such statements as have been made that pus will be blown into the mastoid and thus cause mastoiditis need hardly be considered. Experiments which have been made upon the cadaver, and the daily experience of those who are constantly treating subacute and chronic conditions of the ear with the Politzer bag, and even the catheter, speak entirely against such an occurrence. The writer states that he has treated over five hundred cases with this method and has not observed a single case in which he could attribute a mastoiditis to this procedure.

ACUTE OBSTRUCTION DUE TO APPENDICITIS.

Although this complication has received very little consideration, it may occur at any period of an appendicitis, and four methods of occurrence are described by HAECKEL (*Deutsche Zeitschrift für Chirurgie,* lxxxvii, 1).

In the acute attack obstruction may follow: (1) Local peritonitis, causing local paralysis of the wall of the bowel. This is usually complicated by adhesions. If

obstruction continues after operation, it may be necessary to expose the bowel and make a fecal fistula in the paralyzed portion. In some cases a second operation is required for the freeing of adhesions. (2) A large abscess may compress the bowel mechanically. This only occurs in narrow spaces, such as the space of Douglas. The treatment is that of the abscess. (3) Loops of intestine, forming the wall of an abscess, become adherent and thus kinked. It is not wise to separate such loops if there is obstruction, as the danger of causing general peritonitis is very great. There is also danger of tearing the wall of the bowel. If there is great distention of the adherent loops, it is safest to make a fecal fistula; if there is little distention, enteroanastomosis of the part above the obstruction with that below is indicated. If the adhesions are not near an abscess they may be cautiously freed, but if there is the least apparent danger of tearing the wall of the bowel, the attempt should be abandoned. (4) Obstruction during the interval between attacks, due to contraction of scar and inflammatory tissue. This may be due to distortion of the gut, or to compression between the appendix, adherent to the abdominal wall, and the wall. In these cases the adhesions may be freed if there is no danger of tearing the bowel, but if the adhesions are firm it is wiser not to attempt to separate them, and to avoid the obstruction by performing enteroanastomosis. There is no indication for resection of the adherent portion. The final results of the two operations, freeing of the adhesions and anastomosis, seem to be equally good.

REVIEWS.

MODERN MEDICINE: ITS THEORY AND PRACTICE. Edited by William Osler, M.D., Assisted by Thomas McCrae, M.D. Volume II, Infectious Diseases. Philadelphia and New York: Lea Bros. & Co., 1907. Pages 828.

The second volume of Osler's Medicine, which is devoted to Infectious Diseases, opens with an introduction by Hektoen. He considers infectious agents and their source, the ways, means, and routes of infection, toxins and bacterio-proteins, the general questions of natural protection and immunity, the general pathology of infectious serum therapy, opsonins and agglutinations. Such an introduction is necessary for an understanding of the articles which follow. It is appropriate to have it come from the head of one of the few great schools of pathology in the country, and it is in every way worthy of Dr. Hektoen. The section will be invaluable to the medical man who has not had the opportunity of keeping abreast with more recent work upon infectious diseases.

The first disease considered is typhoid fever, and the article upon it is by McCrae. The subject is extremely well and thoroughly presented, and the writer is to be congratulated upon the paper, which is probably the best short monograph upon the subject in any language. The English-speaking world has the doubtful privilege of almost a monopoly of the study of typhoid, for the disease has almost disappeared from the great Teutonic and Latin medical centers. The Johns Hopkins Hospital has done by far the largest share of the more recent investigations in typhoid, and we welcome this article as the latest and most complete of all of the admirable additions to the literature which have appeared from that source. The three chapters embrace 130 pages and consider the disease from all standpoints—historical, clinical, pathological, bacteriological, and sociological. The literature is thoroughly given, and yet is well digested, so that it is not oppressive. It would be hopeless to

single out particular sections for commendation or criticism. We note with especial interest, however, the paragraphs upon the clinical value of the Widal recation, those upon the modes of infection, which cover very well the work of the Commission in the Spanish-American War and the various water- and milk-borne epidemics, and the consideration of the sociological side of the disease. The paragraph upon perforation is admirable, as would be expected by any one who is familiar with the literature upon this subject which has appeared from time to time from the Johns Hopkins Hospital.

The chapter upon treatment shows how profoundly the advances in the knowledge of the natural history of typhoid have modified our ideas of treatment. It shows too how broad are the foundations upon which the present revival of therapeutics is based. One would be foolish to style the modern treatment of typhoid expectant when we employ such powerful and effective remedies as the bath treatment, the drinking of water to aid elimination, the attention to rest and feeding, and last, but most important, the constant watch of the patient's condition to detect and control complications. Surely few diseases are so actively and effectively treated. We believe that there is no more intelligent and important chapter in the volume than that upon the treatment of typhoid, and we therefore suggest to Dr. McCrae that the quotation which he has chosen for his capital is misleading. It is by Nathan Smith, and reads: "It does not follow that the disease in all cases requires remedies, or that a patient should necessarily take medicine because he has the disease."

The articles upon relapsing fever and typhus fever are also by McCrae.

The chapters upon smallpox and chickenpox are by Councilman, and are in every way an admirable consideration of the subject. Probably the section of greatest interest is that upon the etiology, which the writer is so eminently fitted to discuss.

Vaccination, by Dock, is very satisfactory. We hope, however, for our sakes that the author has been given an opportunity of writing some other section which will be more peculiarly in line with the investigations in which he is especially interested.

Scarlet fever, and diphtheria, are by McCallom, aided by Mallory, and represents especially the excellent work done in these diseases in the South Department of the Boston City Hospital.

Measles, mumps, and whooping-cough are by Ruhräh; influenza by Lord; dengue by Coleman, of Georgia; erysipelas by Anders.

We are glad to have the article upon cerebrospinal meningitis by so able an authority as Dr. Koplik. His account of the etiology of the disease is very interesting.

Lobar pneumonia is by Musser and his associate, George Norris. It includes much new statistical material, for as the authors say in a foot-note to their title, they have "endeavored to collect all the statistics which are available. The statements made are based upon the study of thousands of cases reported in all parts of the world." To these have been added a large series of their own cases. No man is better suited to write the section than is Musser, for such an article implies the correlation of an immense amount of material, sociological, pathological, experimental, and clinical, and this needs a physician of great experience both in the natural history of the disease and also in the writing of medical text-books. Dr. Musser amply fulfils both qualifications. The article bears evidence that he has been ably supported by Norris. The chapters comprise about 100 pages. The sections upon etiology, bacteriology, and pathology are quite adequate. We turn with especial interest and expectation to the chapters upon symptomatology and treatment, for here we expect to reap the fruits of the enormous clinical experience of the senior author. In the main, the symptomatology, complications, and sequelæ are quite satisfactory; the treatment especially so, for no one understands better than Musser that the development of our knowledge of infections means a more active and intelligent treatment of them

along scientific and rational lines. But here the thought recurs, as it has done many times in reviewing the other articles in the System: it is unfortunate that the consideration of disease in such a book must be encyclopedic and not personal. We miss the chance of knowing Dr. Musser's personal opinion about the value of certain symptoms and physical signs, and which methods of treatment he employs himself. Let us hope that in the near future he may give us a monograph which will include his personal views upon pneumonia.

Asiatic cholera is by Dunbar, of Hamburg, and is very satisfactory.

One of the most interesting as well as valuable papers in the volume is that by James Carroll upon yellow fever. It is a great privilege to have on record in this standard work an account of the work done by Carroll, Reed, and their associates, written by one of their number. Besides being a description of the disease by one than whom no one is better fitted to write it, the section upon etiology adds much to the historical side of the book. We note a very pleasant tribute to Dr. Sternberg, and several references to Dr. Guiteras's confirmatory observations.

Richard Pearce writes the chapter upon toxemia, septicemia, and pyemia. The subject is very well presented and the ground is well covered. He emphasizes the value of blood cultures, and gives a very helpful section upon the antistreptococcic sera. We miss a consideration of inoculation by vaccine, which would have been timely and interesting.

Acute rheumatism, by Poynton, is extremely well done. The article is moderate and comprehensive, and while the author's attitude toward the disease is quite in accord with the most recent investigations, still he avoids an excessive enthusiasm for the bacteriological side of the question, and his consideration of the symptomatology and treatment is most satisfactory to the clinician. His paper is limited to the acute and undoubtedly infectious form of rheumatism, and he does not consider any other form of arthritis.

The chapter upon bubonic plague is by Calvert.

The last section is upon bacillary dysentery, and it is written by Dr. Shiga. The article has much the same historical value as that upon yellow fever. A point of added interest is the fact that Dr. Shiga wrote the article himself in English.

On the whole, the second volume quite maintains the standard set by the first, and in some respects surpasses it. J. D. S.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by H. R. M. Landis, M.D. Volume III, September, 1907. Lea Brothers & Company, Philadelphia and New York, 1907.

The present issue of *Progressive Medicine* contains an article upon diseases of the thorax and its viscera, including the heart, lungs, and blood-vessels, by Dr. William Ewart, of London; one upon dermatology and syphilis, by Dr. William S. Gottheil, of New York; one upon obstetrics, by Edward P. Davis, of Philadelphia; and finally a summary of the literature upon diseases of the nervous system, by William G. Spiller. In Ewart's article a very considerable amount of space is devoted to the therapy of the various conditions with which he deals, notably one upon pulmonary hemorrhage in tuberculosis, and another upon the physical signs of acute respiratory and cardiac affections. There is also considerable space devoted to cardiac arrhythmia and heart clot. The article by Dr. Gottheil is written in a very entertaining manner, and gives much sound advice in regard to measures which should be taken in treating various diseases of the skin, particularly epithelioma and lupus. Syphilis is also carefully considered from its diagnostic and therapeutic standpoint. Perhaps one of the most interesting parts of the article by Dr. Davis is the space which he devotes to the diagnosis of early pregnancy in the treatment of placenta previa and in the treatment of eclampsia, all of which conditions come before the general practitioner for a careful consideration. It is interesting to

note that many Continental physicians are now resorting to veratrum for the control of eclamptic seizures. In Dr. Spiller's article upon diseases of the brain there is a careful consideration of brain tumors, aphasia, cerebral hemorrhage, and encephalitis. So, too, in the articles on diseases of the spinal cord, he considers the condition of the rectal sphincter in tabes, syphilis as a cause of tabes, and the value of the Argyll-Robertson sign in the diagnosis of ataxia.

DISEASES OF INFANCY AND CHILDHOOD. Their Dietetic, Hygienic, and Medical Treatment. By Louis Fischer, M.D. Freely Illustrated. The F. A. Davis Company, Philadelphia, 1907.

This new candidate for professional honors in the field of pediatric literature opens with a colored plate showing a child suffering from scarlet fever, which plate, by the bye, is considerably better than most colored plates which represent acute infectious diseases. The volume opens with chapters upon the development and hygiene of the infant and with diagnostic suggestions, then passes on to the abnormalities and diseases of the new-born, and then takes up the important subject of feeding in health and disease, to which about 150 pages are devoted. This, in turn, is followed by chapters upon diseases of the various parts of the body, such as the alimentary canal, the respiratory system, the circulatory system, the nervous system, and the infectious diseases. The last chapter of the book deals with the modification of milk, the examination of gastric contents, the urine, the use of anesthetics in children, the method of administering drugs to this class of patients, and a table of doses. Altogether the book shows, from first to last, the fact that the author is an active practitioner in the diseases of children, and that he writes very largely from his own personal experience, although of course in these modern days it is quite impossible not to quote a good deal from the experience of other investigators. The book is quite freely illustrated, and while the execution of the illustrations is not what it might be, they are sufficiently clear to show what the author intends to emphasize. We have no doubt that this book will soon take its place with the best of American contributions to this important subject.

A TEXT-BOOK OF PHYSIOLOGY FOR MEDICAL STUDENTS AND PHYSICIANS. By William H. Howell, M.D., LL.D. Second Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1907. Price $4.00.

This is one of the smaller works on physiology, but the method in which it is printed permits the author to embody in its pages an immense amount of valuable information. As has been well said by one of the foreign journals, it is at the present time one of the best text-books of physiology in existence, being written by one who embodies not only the experience of a successful teacher, but also that of an original investigator in this sphere of medical science. The author has also recognized the fact that the average student of physiology studies this subject with the ultimate object of practicing medicine rather than becoming solely a scientific physiologist, and he therefore frequently points out the practical bearing of physiological facts. We regret that in many instances the text is so condensed that separate paragraphs do not occur for a considerable space, which always renders the use of a volume by the student more difficult than when minor subjects are separated one from another by proper spacing with the type. Modern physiology has undergone such changes in the last few years that much that is in this volume will prove of great interest to practitioners of some years' standing as well as to those who are endeavoring to obtain their medical degree.

A MANUAL OF HYGIENE AND SANITATION. By Seneca Egbert, A.M., M.D. Fourth Edition, Enlarged and Thoroughly Revised. Lea Brothers & Company, Philadelphia, 1907.

Medical students and practitioners needed for many years a brief manual of small size which would give them the necessary facts in regard to hygiene and sanitation. Dr. Egbert has succeeded in compiling

such a manual. The present volume of a little less than 500 small octavo pages deals with the subjects which are usually considered in such manuals, such as ventilation, water, foods, stimulants, beverages, personal and school hygiene, disinfection, quarantine, sewage, military hygiene, and vital statistics. On page 269 there is an interesting diagram showing the relative value of certain staple foods which puts in a graphic way information which it is well for the physician to remember. We are interested to note in the chapter upon stimulants and beverages that the author holds the view that under our present high tension of living there is a real physiological demand and need for them that, perhaps, should be satisfied in a measure, but with moderation and judgment. He also quotes with approval Fothergill's rules for the use of alcohol by the healthy, to wit: never have alcohol in the brain when it has work to do, and secondly, a little alcohol between a man and past trouble is permissible, but it is not well to put a little alcohol in front of a coming trouble. In other words, alcohol is a good servant but a bad master.

This book does not profess to be an exhaustive manual of hygiene, but is written in a somewhat conversational style which is easy to read, and affords valuable collateral reading for medical students and practitioners.

A Text-book of Physiological Chemistry for Students of Medicine and Physicians. By Charles E. Simon, B.A., M.D. Third Edition, Thoroughly Revised. Lea Brothers & Company, Philadelphia, 1907.

The first edition of this book appeared six years ago. It was designed as a guide in the physiological and chemical laboratory, and that it has proved popular is evident from the fact that its third edition is now before us. After introductory matter which covers about nine pages it deals with the chemistry of the albumins, the carbohydrates, the fats, the cleavage products of the albumins, the ferments, and the digestive fluids. Then follow chapters upon the processes of digestion and absorption, upon bacterial action in the intestinal canal, upon the feces, the urine, the blood, the muscle and nerve tissues, the eye and ear, and various other organs of the body. It goes without saying that much of the matter which is included in this volume is not of very great use to the physician in daily practice, but, on the other hand, the student who makes himself familiar with the theories, facts, and processes which are described will find in his days as an active practitioner that many pathological problems which would otherwise be obscure are clear. The issuance of a third edition depends upon the fact that the earlier edition was exhausted and upon the desire of the author to bring the text up to the latest investigations which have given results which can be considered reliable.

Pharmacology and Therapeutics. By Reynold Webb Wilcox, M.A., M.D., LL.D. Seventh Edition, Revised. P. Blakiston's Son & Company, Philadelphia, 1907. Price $3.00.

The contributions which have been made by Dr. Wilcox to the literature of materia medica and therapeutics consist of two volumes: one, that now under notice, and the other a companion volume upon materia medica and pharmacy which naturally is more elementary in its text than the one under consideration. In this volume the drugs are considered under special classifications and not in alphabetical order. The first classification, namely, that of "Drugs acting upon organisms which affect the human body or upon processes going on outside of it," seems to us a good illustration of the hopelessness of carrying to a satisfactory conclusion the classification of drugs for the use of students. Naturally, the most important drug considered in this class is mercury and its various salts, and we also find that antiparasitic drugs, such as male-fern, pomegranate, pumpkin seed, sulphur, and thymol, belong to the same classification, as does also cinchona and its salts. Other divisions are drugs which act upon the blood, upon the cardiac mechanism, upon the blood-vessels, upon the skin, etc. The book does not profess to be an exhaustive exposition of

pharmacology and drugs, but it is a very excellent résumé or summary of much of our present knowledge concerning the action and value of medicinal remedies.

PRACTICAL DIAGNOSIS. The Use of Symptoms and Physical Signs in the Diagnosis of Disease. By Hobart Amory Hare, M.D., Sc.D. Sixth Edition. Revised and Enlarged. Lea Brothers & Company, Philadelphia, 1907. Price $4.50.

The design of this book is to present the subject of diagnosis to the practitioner and student in such a manner as to make it easy to arrive at a conclusion in regard to the cause of the symptoms which are presented by the patient. The various diseases are not considered primarily, but, instead, symptoms are carefully considered as they are observed at the bedside, and then the various conditions which could produce these symptoms are differentiated one from another. Thus, in the chapter on the Feet and Legs the various manifestations of disease which appear in these parts are discussed, and the different diseases which produce these symptoms are then considered. So, too, in the chapter on headache and vomiting, the causes of these prominent symptoms are taken up and the conditions in which they arise are then considered.

A PHYSICIAN'S MANUAL OF THE PHARMACOPOEIA AND THE NATIONAL FORMULARY. By C. S. Hallberg, Ph.G., M.D., and J. H. Salisbury, A.M., M.D. The American Medical Association, Chicago, 1907.

This little pocket book of less than 200 pages appears as an epitome of all the articles contained in the U. S. P., Eighth Decennial Revision, and the National Formulary, and now that the United States government has made these two books official standards of strength and purity it possesses a value to physicians and pharmacists which it would not have possessed had it existed some years ago. The great advantage of the arrangement is that it gives under the pharmaceutical description of many drugs prescriptions which illustrate the best way of combining these remedies to produce good therapeutic results. In other words, it is a condensed pharmacopœia and formulary from which a large amount of very valuable information can be obtained. The doses, of course, are given, and the volume closes with a brief therapeutic index which does not of course describe the exact conditions in which the remedies are useful, but indicates in a general way the class of cases in which they can be employed.

GREENE'S ENCYCLOPEDIA AND DICTIONARY OF MEDICINE AND SURGERY. Volume V: Inulin to Lumbar Puncture. William Greene & Sons, Edinburgh and London, 1907.

We have already referred to the previous volumes of this encyclopedia in terms of praise. The contributors to the present volume are well known Englishmen who have written articles, in almost every instance, which are worthy of the reputation which they have achieved in their other contributions to medical literature. We are told in the preface that there are 47 articles of more than one thousand words; 69 articles of less than one thousand words and at least 10 lines in length; and 792 subheadings in short paragraphs dealing with more or less important subjects and divisions. Under the head of "Labor" a large number of conditions which complicate pregnancy and labor are discussed. To those who wish an English work giving encyclopedic information concerning matters medical we can cordially recommend the purchase of this one.

PRACTICAL FEVER NURSING. By Edward G. Register, M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1907. Price $2.50.

The object of this book is to present the subject of fever nursing to nurses rather than to practitioners, the idea of the author being that a nurse if she is to intelligently care for a fever patient must have some knowledge of the causes of the illness. It is not necessary that she should know the cause and significance of many of the symptoms, but at the same time the author believes that the more prominent ones should be clearly understood by her, and that such an understanding cannot be reached unless she knows something of the pathological processes which produce

the symptoms. The book is copiously illustrated, shows the methods of giving the various baths and affusions, hot packs and cold packs, and seems to us in every way able to fulfil the object for which it was compiled; so it can be cordially recommended for the class of readers for which it is intended.

A MANUAL OF MATERIA MEDICA. Especially Designed for Students of Pharmacy. By E. A. Ruddiman, Ph.C., M.D. Lea Brothers & Co., Philadelphia, 1907.

As this book is designed for students of pharmacy rather than for students of medicine, it contains practically no therapeutic information except that of a general nature, but, on the other hand, devotes itself to concise and concrete descriptions of the physical characteristics of those drugs which make up the materia medica of the present day. It also devotes considerable space to the toxicology of those drugs which are noteworthy as poisons. The author has adopted the general arrangement of well-known books on materia medica for that department which deals with pharmacognosy, and has used a modified arrangement of "Hare's Practical Therapeutics" for such therapeutic information as he thinks it wise to give. The dose of each medicinal substance is given in addition to the other facts concerning it.

A MANUAL OF CLINICAL DIAGNOSIS BY MEANS OF MICROSCOPICAL AND CHEMICAL METHODS. By Charles E. Simon, B.A., M.D. Sixth Edition, Thoroughly Revised. Lea Brothers & Company, Philadelphia, 1907.

As indicated in the title of this volume it is designed to be a "clinical diagnosis," not from the standpoint of physical signs but from the standpoint of chemical and microscopical examination of the secretions and tissues of the body. That it has thoroughly fulfilled its function is evident from its popularity. It is a much more useful book to the practitioner than the "Physiological Chemistry" by the same author which we have reviewed in this issue of the GAZETTE. No physician who has a private laboratory in which he examines the secretions of his patients can afford to deprive himself of the aid which this book will give him, or his assistant, in the investigations which it is essential that he should carry out to a successful conclusion.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by W. T. Longcope, M.D. The J. B. Lippincott Company, Philadelphia, 1907.

The present volume opens with four therapeutic articles dealing with diabetes, pneumonia, mechanotherapy, and tuberculosis. Other articles follow upon medicine, surgery, gynecology, genito-urinary diseases, ophthalmology, neurology, dermatology, and pathology, the latter being devoted to a consideration by Dr. Craig, of the United States Army, of the intracorpuscular conjugation of the malarial parasite.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. Authors and Subjects. Second Series, Volume XII. O to P.

It is only necessary to welcome to the shelves of the library this monumental work of reference, which provides the medical profession of this country, and of other countries, with a complete list of medical literature as it exists to-day. It is impossible to estimate the benefit which has accrued to humanity in general and to the medical profession in particular by the publication of this splendid work.

A REPORT ON THE ORIGIN AND PREVALENCE OF TYPHOID FEVER IN THE DISTRICT OF COLUMBIA. By M. J. Rosenau, L. L. Lumsden, and Joseph S. Castle, including articles contributed by Stiles, Goldberger, and Stimson. Hygienic Laboratory, Bulletin No. 35. Government Printing Office, Washington, 1907.

This is an exhaustive consideration of the subject named in the title, covering nearly 400 octavo pages and illustrated with numerous charts. It deals with the epidemiology of the disease, and with the influence of milk, ice, and water in the dissemination of the malady. It also discusses the longevity of the bacillus typhosus outside of the human body; the alleged rôle of intestinal worms as inoculating

agents in typhoid fever; and a chemical examination of the water-supply of the District of Columbia. Analyses are also given of a number of bottled waters which are commonly supplied to the inhabitants of that district. Like the rest of the contributions from this department of the Public Health and Marine Hospital Service of the United States, this one adds very materially to our knowledge in general and to that of this almost universal disease in particular.

A MANUAL OF DISEASES OF THE EYE. For Students and General Practitioners. By Charles H. May, M.D. Fifth Edition. William Wood & Company, New York, 1907. Price $2.00.

Five editions and one or two extra printings of this most excellent little work upon diseases of the eye have appeared since August, 1901. It has been translated into German, Italian, French, Dutch, and Spanish. It is copiously illustrated in black and white and in colors, and while not large enough to be an exhaustive work it is a first-rate one for the general practitioner, who often has ocular conditions to study and care for.

THE PHYSIOLOGY OF ALIMENTATION. By Martin H. Fischer, M.D. John Wiley & Sons, New York, 1907.

This book is intended for those whose interests lie in physiology as a science contributory to medicine. It does not profess to be a complete review of the physiology of the alimentary tract. It only deals with those subjects which the author has been accustomed to present to his students as Professor of Pathology in the Oberlin College of Medicine. It deals adequately with the movements and functions of the alimentary canal and with the digestion and utilization of foodstuffs.

NUTRITION AND DYSENTERY. By U. N. Mukerji, M.D. S. K. Lahiri & Company, Calcutta, 1905.

The object of this book, but just received, is well described in its title. It is designed to emphasize the importance of proper nutrition in epidemic dysentery, and contains a considerable number of tables illustrating the nutritive value of various foodstuffs and the urinary solids which are excreted under their use, and in the presence or absence of this disease.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.A., M.D.

Congresses are in season. The frequenter of congresses is in the seventh heaven of enjoyment: a four-hour run to Exeter, and he is in the midst of British Medical Association revels; back to London, and he can hear the subject of educational hygiene turned inside out and upside down at the International Congress of School Hygiene; or if perchance he tires of so limited a subject (eleven sections, not including subdivisions), he can be at Leicester within a couple of hours and hear the British Association discussing all things in heaven and earth, including a smattering of medicine; and if he still craves for congress, he has only to take a short sea trip to Stockholm, where he will find the Eleventh International Congress on Alcohol in full swing; or to possess his soul in patience till next month, when he can hear the milk question discussed from every point of view, practical and impractical, at the Congress on Gouttes de Lait in Brussels. Surely if in the multitude of counselors there is wisdom, the twentieth century should be an era of wisdom unalloyed!

But to return to Exeter: certainly this year's meeting, if it lacked the extraordinary interest of last year's travel in distant

lands, was not lacking in scientific interest; the subjects for discussion had been well chosen, and stirred up some valuable debate. Dr. Risien Russell opened a discussion in the Section of Surgery on the indications for operation in cases of intracranial tumor, and laid stress in his remarks on some very important practical points; it is generally supposed that the proper treatment for syphilitic tumors of the brain is the administration of mercury and iodides, and if moderate doses fail the drugs are still to be pushed as the one hope of cure; but Dr. Russell said that surgical intervention is necessary in a considerable proportion of these cases, and his experience has convinced him that it is useless to waste valuable time in pushing antisyphilitic drugs if the symptoms do not speedily show evidence of yielding to such treatment. In cases of intracranial tumor in which urgent pressure symptoms supervene, or a patient is too ill to allow of any trephining operation, he considers that lumbar puncture is sometimes useful as a temporary and palliative measure.

The value of lumbar puncture both as a therapeutic and as a diagnostic measure was also under discussion in the Section of Medicine; the subject was introduced by Dr. Farquhar Buzzard, whose name, like that of his father, is already well known in connection with diseases of the nervous system. Amongst many views of the subject the absence of any protest against its indiscriminate use was remarkable and disappointing; there was much talk of its value in diagnosis, and some held that it is of service occasionally in treatment, but no one referred to the possible risks of its use.

One of the most attractive of the discussions was that in the Section of Physiology on the value of alcohol, which aroused great interest. It was opened by Professor Cushing with an able survey of the subject, which was characterized by more temperance than speeches on this topic often show: indeed, it was in marked contrast to some of those utterances which have recently been made by leading members of the profession in this country, and which rather incline the advocate of temperance to say, "Save me from my friends!" Professor Cushing said that it is undeniable that 95 per cent of alcohol taken undergoes combustion in the body, and is therefore a source of energy: it helps digestion by stimulating appetite; it might aid a failing heart; it has been shown by experiment on typesetters and students that the capacity for quick and accurate work is diminished by alcohol; in large doses alcohol undoubtedly diminishes the power of resistance to disease, but there is no evidence that small quantities have this effect. Experiments on animals are fallacious, for alcohol acts as a narcotizing agent on them, whereas on man it has an exciting effect.

In the Section on Diseases of Children Dr. Voelcker gave an interesting introductory address on nephritis in childhood, investigating the relation between renal inflammation in childhood and that in later life; and on the whole finding the prognosis less gloomy than is sometimes thought when a child develops nephritis. In the Dental Section a brisk discussion took place on dental caries in childhood; the chief opener was Mr. Edmund Owen, whose racy speeches always cast some ray of cheerfulness on the gloomiest of occasions, and in this particular instance were the more welcome as the Dental Section was consigned to a dungeon-like department which in more orthodox times served for the trial of criminals, and which the liveliest of counsel could hardly render more than tolerable. However, more than the requisite "twelve good men and true" were impaneled to try this weighty issue, and Mr. Owen held forth in no measured terms on the degeneracy of modern times in the matter of diet. He thought that our white bread, with its unnaturally white flour, is partly responsible for the prevalence of dental decay in children; he inveighed also against the use of patent foods for infants, which he said are the cause of much rickets, and so of wide-spread dental caries; and he appealed to the dentists for more active

measures in dealing with decayed teeth in children; such teeth, he said, should be removed without hesitation. From the medical standpoint I had the honor of opening the discussion, and pointed out the profound influence on nutrition which may result from dental caries in children. Nervous disorders, such as headaches recurring frequently, and habit spasm, and sometimes even epilepsy, are traceable to this cause; it is probable that indirectly if not directly decayed teeth favor the occurrence of tuberculous disease of the lymphatic glands in the neck. Diet probably has rather an indirect than a direct influence in promoting caries; it affects digestion, and so alters the secretions in the mouth that bacteria are able to produce fermentation about the teeth and so erode the enamel; sweets probably act in this way by disturbing digestion, not by any direct effect upon the teeth.

The inhabitants of Exeter, medical and otherwise, showed no lack of hospitality to their visitors, and this visit of the British Medical Association to the west of England was a notable success.

Before the meeting was over the International Congress of School Hygiene had begun its session in London, and many hurried back from Exeter to take part in it. Sir Lauder Brunton was the moving spirit in this and gave the presidential inaugural address. The headquarters of the Congress were at the University of London in Kensington, where the opening meeting was held. The Earl of Crewe had been requested by his majesty the King to attend the formal opening of the proceedings, and made an excellent speech expressive of the interest taken by the present government in the health of the schoolchildren of this country. On behalf of the late government Lord Londonderry spoke in the same strain, specially approving of military drill for boys. Sir Lauder Brunton in his presidential remarks hinted at some obscure *contretemps* which had threatened to make the Congress a fiasco; and rumor says that on some point the Board of Education and the Foreign Office were at variance, and that it was only by the King's good services that the quarrel was settled in time to allow the Congress arrangements to be carried through. The dominant note of Sir Lauder's speech, as indeed of most of the papers read at the Congress, is the need for medical inspection of schools. Altogether 244 papers were read, so I cannot attempt even to mention the gist of the few which I happen to know something about. Suffice it to say that there were several wholesome protests against the overworking of children at school, that there was a strong feeling that the elementary principles of hygiene should be taught both to teachers and scholars, and that one and all clamored for medical inspection, and that there seemed to be a sort of idea that some enormous national benefit would accrue from the heaping up of statistics which might be achieved by medical inspection. I must defer any further account of the proceedings till next month. The Congress ended its work on August 9, each section drawing up some resolution as the result of its deliberations; and a small permanent committee was formed to promote the interests of school hygiene. A final address was given by Professor Griesbach on the relations between medicine and pedagogy.

Amongst the events of the month a very gratifying one is the large gift from Mr. Carnegie to the King Edward VII. Hospital Fund. Hitherto Mr. Carnegie's generosity has taken the direction chiefly of educational endowment, but the £100,000 which he has now given will go to a good purpose, if it be used more wisely than the hospitals themselves seem inclined to use their funds. The building-itch has attacked so many hospital institutions that it is high time for some central authority to put bounds to the thriftless extravagance which some London hospitals have recently shown in this direction.

Another event which must be mentioned is the promotion of Prof. Howard Marsh, the Regius Professor of Surgery at Cambridge, to the Mastership of Downing College, which was held till recently by Dr. Alexander Hill.

PARIS LETTER.

BY R. H. TURNER, M.D. (PARIS).

Claims for damages are not often asked in France by patients, so that a recent case in Paris has excited a good deal of attention. A medical man, Dr. Cormon, had been called in to attend a young woman, Mlle. Peyronnette, suffering from appendicitis, and as the result of his treatment by ice-bags an eschar had formed, and 50,000 francs damages were claimed. Dr. Balthazard, the medical expert, who had been chosen by the court to give his opinion, had been rather severe in his first report, but when the trial came on he was much less so, and he found arrayed against him the whole faculty, who one and all considered this eschar an accident which in nowise could be foreseen. Dr. Cormon had been accused of not using a piece of flannel cloth as a protection, but he argued it was the practice of many surgeons to apply the ice-bag directly on the skin. The prosecution found it could not attack Dr. Cormon on this count, so it accused him of having failed to see the symptoms indicating the advent of an eschar. Dr. Cormon, who remained very calm and cheerful through the whole proceeding, answered that he had foreseen them, and had then had the ice removed. Dr. Jalagnia and Professor Dieulafoy declared that there was no exact limit as to the amount of time during which ice should be used on the abdomen, and as for the eschar, it sometimes appears with the greatest rapidity. Dr. Dieulafoy said he came to the bar to defend the medical profession, which was being attacked in the newspapers, at dinner parties, and at receptions. Dr. Cormon had not taken the temperature of the patient, which was another fault of which he was accused. Dr. Triboulet, who succeeded to Dr. Cormon in the treatment of the patient, said he had very few changes to make in what was done. Judgment was given as usual a week after the calling of witnesses, and Dr. Cormon was acquitted.

In connection with this the following is published in the *Matin:* "A millionaire, Mr. Soller, has offered a million francs to the Assistance Publique, the great medical charity organization of Paris, to be used in controlling the physicians and surgeons of the Paris hospitals. Mr. Soller thinks that they are apt to forget that the patient is not to be used as a means of experimenting with new remedies. The counsel of the Assistance Publique, after having heard what a certain number of physicians had to say about this, refused the bequest, as no physician would care to be supervised by men who were not physicians."

This is now the great season for watering-places, and everything is at its best at the French resorts. During a recent trip to one of the latter the writer of this letter was able to judge of the efforts that are being made to attract patients. At Aix-les-Bains there were to be seen in May and the early part of June the usual crowd of English people who visit this famous resort at this time in preference to a later season. In fact, Aix-les-Bains is very hot in midsummer, this excessive heat being perhaps part of the cure in connection with the warm baths. Still, if one cares for quiet, it is best to take one's treatment in June or in September: There was a good deal of interest excited by the question of the closing of the gaming tables, which are an important source of revenue to the Casino. In the month of May there was no playing allowed, and up to the 3d or 4th of June the place remained very quiet. As soon as permission was given by the central government the tables were brought out, and immediately an undesirable crowd of visitors made its appearance in Aix-les-Bains.

Vichy toward the end of May is quiet and peaceful, quite different from what it becomes a few weeks later, when the crowds of patients, one hundred thousand a year, begin to appear. The bathing establishment, which was opened in 1902, is marvelously clean and well built, and the Casino is also most artistic. A resort

which is gaining steadily in public favor is Chatel Guyon, a small village near Clermont-Ferrand, in the Auvergne, which is a volcanic country and full of hot springs. The waters, which are specially characterized by chloride of magnesium, are excellent for the treatment of muco-membranous enteritis, constipation, or diarrhea. They have a tonic effect on the intestines, and 10,000 to 15,000 bathers come every year now. There is at present a strife between two companies as to getting the water, somewhat like that seen in former days in the oil regions, the new company sounding here and there to find new springs. It is backed by financiers, and may cause some damage to the old company. The water is not unpleasant, and the baths, which contain carbonic acid and are furnished with running water, have a most tonic and agreeable effect.

Further south lies La Bourboule, a climatic resort, famed for containing in its waters the largest amount of arsenic in Europe, the equivalent of 21 drops of Fowler's solution in each liter. They are much employed for skin diseases, scrofulous children, and convalescents. Mont-Dore, which is situated further up the valley of the Dordogne, is more for asthma and chronic laryngitis, and the season opens later there, not much before the 15th of June, as the altitude is well-nigh 3300 feet.

On the other side of the mountains lies Royat, near Clermont-Ferrand, which has also arsenical waters, and is now getting up a reputation for heart troubles; and to the east, in a pretty little valley, lies St. Nectaire, famous for its use in albuminuria. The whole country of Auvergne is filled with old ruined castles, and nothing could be more agreeable for a medical man than to motor through such a country, where at every watering-place he will be most hospitably received, given the treatment gratis, and entertained by the medical men of the place.

Further south lies Le Puy, which, though not a medical resort, is perhaps in some ways the most interesting town in France, volcanic eruptions having left their traces in the surrounding country by the formation of high dykes or craters.

At this time of the year Paris is not only deserted by its inhabitants, but also by the medical practitioners, so that the few who remain in town often have their hands full seeing to all the patients who may need their care. It is hard to get a specialist if some obscure nervous trouble or peculiar form of anemia needs investigation, and it is then found how much the existence of specialists is useful to the general practitioner.

A month or two ago a book was published in Paris bearing the title of "Defends ta pean contre ton médecin," which means "Protect your life against your doctor." This book had been extensively advertised, placards with the title being pasted up on buildings in various parts of Paris. It is a scurrilous attack on doctors, written by two men who seem to know something about medical life, and who seek to show that medical men are usually incompetent, untrustworthy, and lacking in every virtue or quality. One wonders what may be the cause of all this excess of ire on the part of the authors, but on reading the chapters on radiography it may be inferred that the fact that physicians have been given a practical monopoly of this branch of therapeutics has aroused the indignation of these men. The book at first is somewhat amusing, but one tires soon of the constant flow of malice which is poured forth page after page. There is, as usual, a few grains of truth in what is published in this work, but one can see soon enough that the writers are playing the rôle of *advocatus diaboli*. It can be said of any profession that there are good and bad men who practice it, but it would be well-nigh impossible to find men more painstaking and conscientious than those who grace the medical profession, either in Paris or in other countries.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXI. | DETROIT, MICH., NOVEMBER 15, 1907. | Third Series, Vol. XXIII, No. 11.

ORIGINAL COMMUNICATIONS.

A SYMPOSIUM UPON NEPHRITIS.

The Pathology and Classification of Nephritis.

BY JOSEPH MCFARLAND, M.D.,

Professor of Pathology in the Medico-Chirurgical College of Philadelphia.

The morbid conditions of the kidney collectively spoken of as *nephritis* present themselves under conditions that may be conveniently grouped as follows:

1. Those depending upon and occurring in association with well-defined and easily-recognized lesions originating primarily in the kidney or the structures with which it is in relation. In this group may be placed nephrolithiasis, hydronephrosis, pyonephrosis, "surgical kidney," tuberculosis, and the neoplasms.

2. Those depending upon the colonization in the kidney of microöganisms brought from distant primary foci of disease by the circulating blood—pyemia, miliary tuberculosis, septicemia, smallpox, etc.

3. Those depending upon certain constitutional disturbances of uncertain nature, characterized by general fibrosis of all the organs, with cirrhotic changes in the kidney—arteriocapillary fibrosis, arteriosclerosis, chronic syphilis, gout, lithemia, etc.

4. Those depending upon chronic forms of intoxication with fibrotic changes chiefly located in the kidneys—chronic interstitial nephritis, lead poisoning, etc.

5. Those depending upon the action of definite chemical intoxications, as poisoning by cantharides, turpentine, mercuric chloride, phosphorus, ether, etc.

6. Those resulting from intoxications associated with various well-known infectious diseases, such as yellow fever, scarlatina, pneumonia, diphtheria, etc.

7. Those occurring in certain definitely toxic affections not known to be infectious, as acute yellow atrophy of the liver.

8. Those developing during periods when the metabolic and physiologic equilibrium of the body are disturbed, as at puberty, during pregnancy, etc.

9. Those arising from causes not yet explained.

To the writer all nephritis is secondary and toxic. The primary lesions are to be looked for in other organs through whose morbid activities the blood becomes surcharged with matters injurious to the renal tissue.

The studies of toxins made during recent years show us various facts that bear aptly upon the study of nephritis. Thus we find that many toxins have effects, mostly irritative effects, in common; others effects that are peculiar and specific. Toxins of various kinds therefore produce varying effects upon the kidney according to their constitution. Furthermore, toxins not infrequently have definite specific affinities for certain cell groups.

Again, the degree of concentration of the toxin must materially modify the effect it exerts, and finally the duration of the injurious action produces a considerable variation in its effect.

In the study of nephritis we deal mostly with toxic substances that have in common

an injurious effect upon epithelial tissues, and in particular a destructive effect upon the kidney. This is probably because the cells of the kidney being the most active eliminative cells of the body, seize most energetically upon the poisons in order to remove them from the blood. In most cases of nephritis, some parenchymatous degeneration takes place in the tissues of other organs, notably the liver—another great emunctory.

When we come to inquire the actual nature of the toxic agents in nephritis, we find them too numerous, and probably too dissimilar, to permit of intelligent consideration. Some are inorganic, some organic; some are well known to chemistry, some well known to bacteriology, some only conjectural in nature. Some show a specific affinity for the parenchymatous tissues, which they rapidly destroy; some act insidiously but destructively; some gently stimulate the connective tissues to proliferation. The effect of some is shown with great rapidity, that of others very slowly.

Intoxication is rarely a simple process. Where one toxic substance is at work, others soon make their appearance, and several dissimilarly acting poisons are soon coöperating. This affords one explanation of what is well known to every morbid anatomist, that renal disease instead of being a simple process is almost always a complicated one.

Another important fact concerning the action of toxins is their tendency to lack uniformity in their effect upon the tissue and occasion scattered foci of intense action throughout a tissue otherwise but slightly altered. Such focal lesions are seen in poisoning by ricin and by diphtheria toxin, and in the liver in typhoid fever. In lead poisoning minute hemorrhages result from injury to the capillary endothelium, and in other cases where the local action of the toxin cannot be seen, its particular affinity for certain cells and tissues can readily be determined by its physiological effects, as in tetanus and venom poisoning. The application of these effects to the lesions of the kidney will be made clear when we come to consider the morbid appearances presented by the organ in the various forms of nephritis.

Classification.—When we come to the question of classification the complicated nature of nephritis becomes a source of embarrassment, for while there are several well-defined types, from the standpoint of the morbid anatomist, they are rather rarely observed. The great majority of kidney lesions are mixed affections of the stroma and parenchyma.

In the opinion of the writer the more simple the classification of nephritis the better. Several well-defined types exist:

1. Those chiefly affecting the connective tissue framework—*interstitial.*

2. Those chiefly affecting the epithelial tissue—*parenchymatous.*

Each of these may be acute or chronic. Cases that are not distinctly acute or chronic may for convenience be called subacute. How much more particularly the clinician should attempt to analyze the kidney lesions, or what practical advantage there may be in so doing, I do not know, but the writings upon the subject contain a number of varieties which when carefully compared are for the most part synonymous. A few terms, such as *glomerulo-nephritis,* with unusually destructive glomerular changes; *productive nephritis,* with more permanent destructive changes in the glomerules; *diffuse nephritis,* which is the real condition found in most diseased kidneys, except those from the very young, and indicates that the morbid process affects both the connective and epithelial tissues; *desquamative nephritis,* in which the epithelial cells become loosened from the basement membrane and are washed out of the tubules, may be useful to facilitate accurate description, but not as indicating definite forms of the disease.

Other terms are simply cumbersome. Thus *tubular nephritis* cannot in any sense differ from parenchymatous nephritis, since there is no parenchyma apart from the tubules, unless the glomerules are meant, when we already have the term glomerulo-nephritis by which to describe

the condition. It seems equally useless to employ the term *exudative,* when all acute forms of nephritis are exudative, or to speak of *croupous nephritis* simply because there are many cylinders—especially as the cylinders are not formed of fibrin.

Morbid Anatomy.—How far it is wise in this symposium to enter upon the description of diseased kidneys I am uncertain. It seems to me that every one present must be familiar with the purulent excavations of surgical kidney and the abscesses associated with nephrolithiasis which constitute the *acute interstitial nephritis,* and with the little, hard, red, granular kidney with the tightly adhering capsule that characterizes *chronic interstitial nephritis.* I commonly find, however, that the atrophic kidney of arteriosclerosis is often confused with chronic interstitial nephritis, and I feel it necessary to point out that when the kidney is but little below normal size, is deeply pitted and grooved, and permits the capsule to be easily stripped from a smooth, shining surface, it is the former and not the latter lesion that is at hand.

I also feel it unnecessary to describe the enlarged, dark-colored, slightly softened, juicy, bloody organ from which the capsule easily strips, that characterizes *acute parenchymatous nephritis* in its typical form, or the large, pale, grayish or slightly yellowish, firm, inelastic organ with slightly adherent capsule and more or less granular surface characteristic of chronic parenchymatous nephritis. I must, however, be particular to point out that when one sees these typical lesions once he sees the atypical or combined lesions ten times, and that it is usually with some hesitation that a diseased kidney can be assigned to its proper generic place.

When we turn from the macroscopic to the microscopic changes characteristic of nephritis, probably one of the first surprises that we receive is the discovery that the extent of the one is not indicative of the other. A kidney sometimes appears to the naked eye to be seriously and extensively diseased though the microscope reveals but little destruction of the epithelium, and *vice versa* it may appear to be in fair condition when examined with the eye when the microscope shows scarcely any normal epithelium. Another matter of practical importance is the distribution of the morbid change. I think that a careful examination of microscopic sections of diseased kidneys will show that it is the exception and not the rule for the parenchyma to be uniformly affected. If the disturbance affect localized areas of kidney substance only, the urine may show as many indications of disease as if the whole kidney were diseased, but the chances of recovery are in proportion to the extent of normal or fairly normal tissue that remains. A kidney in which some portions remain unaffected while others are seriously diseased is probably a much better organ than one in which all of the substance is but slightly affected. This enables us to understand why some cases with very bad urinary findings recover, while others with fewer signs of disease die. That we possess vastly more renal tissue than is necessary to maintain life is shown by the comparatively good health enjoyed by many whose one kidney has been surgically removed, and the surprisingly small quantity of renal tissue that may support life is demonstrable by experimentally removing from one of the lower animals one entire kidney and a considerable part of its fellow. It must also have been remarked by all who are familiar with hydronephrosis, cystic, tuberculous, and other renal lesions.

The *microscopic* lesions of nephritis affect the *interstitial tissue,* the *glomerules,* and the *tubules.*

(*A*) The *interstitial tissue* shows change in all forms of nephritis, whether interstitial or glomerular. In the forms commonly described as parenchymatous they are usually very simple, and consist of congestion with some edema. It is this congestion and edema that give the increased size, the flabby texture, and the dark color to the diseased organs. In nephritis accompanying certain infectious

diseases, particularly diphtheria, there may be added to the interstitial edema more or less pronounced round-cell infiltration in which polymorphonuclear leucocytes predominate, but in which lymphocytes and plasma cells may be conspicuous. Councilman and his associates have dwelt upon the frequent occurrence of plasma cells in the nephritis accompanying diphtheria. In cases in which microörganisms play a part in the kidney lesions, the round-cell aggregations may be numerous and extensive and even progress to actual suppuration. In chronic parenchymatous nephritis there is usually some edema, but a new factor, that of connective tissue proliferation, makes its appearance, and in protracted cases of chronic parenchymatous nephritis so much new connective tissue may be present as to leave one in doubt whether the primary change was in the connective tissue or in the parenchyma.

In the chronic forms of nephritis commonly called *chronic interstitial nephritis* the new formation of connective tissue predominates over all other changes. It is almost always irregular in distribution, beginning in certain foci and slowly invading the organ, so that early changes of this kind are often described as *focal chronic interstitial nephritis*. In the badly diseased areas the parenchyma—both glomerules and tubules—are markedly atrophic, but between these the tissue may show but little change, and side by side with glomerules so atrophic as to be scarcely recognizable, large, healthy, perhaps even hypertrophic glomerules may be conspicuous objects. In all kidneys of fatal chronic interstitial nephritis some healthy glomerules and tubules can be found. This explains why patients suffering from the disease live so long—until not enough normal tissue is present to support life—and also why they die so quickly from complicating affections such as pneumonia, which, quickly compromising the little normal tissue that remains, leaves them devoid of excretory function.

(*B*) The *glomerular tissue*. In many, perhaps most, cases of nephritis the glomerular changes are inconspicuous. Careful thought ought to be bestowed upon this fact as bearing upon the treatment of the case. If the glomerular tissue is without important changes, why does the urine diminish in quantity, especially as the blood-pressure is usually increased? And, this being the case, what advantage can it be to the patient to have the blood-pressure further increased by the administration of drugs? Are our conceptions of the dynamics of the kidney correct? Instead of the watery constituents of the urine being transfused through the glomerular tuft in obedience to the variations of the blood-pressure, do we not see in this fact the certainty that the process is after all one of secretion, carried on by the glomerular cells, which are obedient to the laws of transfusion only when in the state of health? It seems to me that this conception is the only one that explains the paradox of hydremia with increased blood-pressure being associated with diminished excretion of water.

In scarlatina and a few other conditions, mostly infectious in nature, the glomerules suffer serious damage, partly from intoxication and partly from the colonization of microörganisms in the capillaries and in the glomerular spaces. Under these circumstances the epithelial and endothelial cells degenerate, round cells infiltrate the tuft, and the partly destroyed glomerule becomes surrounded by a mass of exudate that fills the glomerular space and sometimes extends through its neck a short distance into the tubules. This constitutes the *glomerular nephritis*. All the glomerules affected are thrown out of service, many of them are injured beyond recovery, and the condition commonly proves rapidly fatal, though the fatality is no doubt dependent upon the number of glomerules so affected. There is little doubt that many cases in which some glomerules have been affected get well.

(*C*) The *tubular tissue*. The true parenchyma of the kidney, the uriniferous tubules, is most prone to morbid change. It seems doubtful whether any one dies of

disease without some kind of toxic disturbance of the tubular tissue of the kidney. Except in a few cases of sudden death from accidental injury I feel that I have never seen normal human uriniferous tubules.

The changes pass through the whole gamut of cellular degeneration, from the simple "cloudy swelling" to complete fatty metamorphosis and disintegration. Sometimes the tubules show but a fairly uniform cloudy swelling; sometimes there is added to the almost uniform cloudy swelling irregularly distributed areas of more complete destruction; sometimes there is fairly uniform fatty change. Some cases are peculiar in a marked detachment of the cells and merit the name *desquamative nephritis*.

During the progress of these cellular changes some morbid product of secretion is poured out into the tubules, where it forms the so-called *urinary cylinders* or *tube casts*. The true nature of this substance has not been determined, but it is an albuminoid, varying somewhat in composition in different cases. Various forms have been described, and their appearances are familiar to all who have turned over the well-illustrated pages of modern textbooks upon diagnosis. Cohnheim thought the tube casts to be important factors in the production of the anuria of nephritis, believing that they obstructed the tubules and prevented the urine from escaping, but this view seems untenable, both because we never find distention behind them indicating that they cause obstruction, and because we do find them in large numbers in the urine. They are more probably indications that trouble exists than themselves the cause of any trouble.

The tubular lesions, though not strictly confined to any part of the uriniferous tubule, are most evident in those portions of it that are most active in secretion—that is, the convoluted tubules. The urinary cylinders are most numerous in the straight and collecting tubules, the desquamation most marked in the convoluted tubules.

A Study of the Symptomatology and the Treatment of Acute and Chronic Nephritis.

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We have long known that albumin does not always mean nephritis—it may be functional, prostatic, or even due to spermatorrhea; while nephritis, at least temporarily, without albumin or casts may exist. Casts have also been found in non-inflammatory diseases of the kidney, and hence alone are no certain sign. Clinically, we still divide true nephritis into acute parenchymatous nephritis, chronic parenchymatous nephritis, and chronic interstitial nephritis, and only these three types will be considered, in regard to symptomatology and treatment.

Among sixty cases of nephritis studied, ten only were cases of acute parenchymatous nephritis. They were unassociated with acute infections of any kind, and therefore true types of this disease. Three gave a history of exposure; one of acute alcoholism; two were pregnant; three were convalescent from scarlet fever, four, five, and seven weeks respectively; one gave no history of importance; all were severe cases, and the mortality was 40 per cent. Nine patients were under twenty-seven years of age; six complained of headache; seven presented some edema; six showed pallor (anemia not being determined by blood examinations); eight had a temperature of 100° F. or more, while the other two had each a slight rise above normal; two complained of pain in the back; two showed eye symptoms; and one suffered from uremic convulsions. The urine was reduced markedly in eight cases; the specific gravity was between 1012 and 1030; albumin was present in marked amounts in all cases; casts (principally granular and blood) were persistently present in all; free blood was found in all but one, and it was doubtful.

This brief study of a few cases is enough to impress one that in acute parenchyma-

tous nephritis the urinary study plays the more important rôle, and this is consistent with the opinion of most clinicians. Indeed, this disease is frequently only diagnosed after a careful urinary analysis. The best example of this is seen when acute nephritis develops in the course of an acute infective disease, where no symptoms are present to suggest it, other than the fact that the patient is not progressing well; hence the necessity for careful measurements and frequent examinations of the urine in acute infections, both surgical and medical. The usual symptoms and signs commonly indicative of this disease are emphasized in the cases studied: a history of previous infection, alcoholism, exposure, and pregnancy; fever of 100° F. or more; headache, nausea, and vomiting; possibly dull distress in the back, although this symptom, looked upon commonly by our patients as a sure indication of some trouble in the kidney, is usually in the lumbar muscles and has nothing to do with the kidneys; pallor, or rather anemia, dry skin, loss of strength and even flesh; some edema; and lastly, the urinary findings. Careful urinary analyses are, I think, more important in acute parenchymatous nephritis than in the other two varieties of nephritis. The picture of reduced urine, high specific gravity, persistent albumin of plus amount, casts of epithelium and blood, and particularly free blood, is consistent and impressive. In acute parenchymatous nephritis there is persistent albumin and casts of the well-known types, with dropsy if glomerulous, and with no dropsy if tubular.

Dr. Cabot has emphasized the importance of the amount of the urine in twenty-four hours, the specific gravity and the color, and while probably these are the most important elements, the amount of albumin from time to time, the persistence of albumin and casts, and the presence of blood are of some importance and deserve consideration, especially in this form of nephritis. This is worth mentioning in order that young practitioners and not too-zealous older ones may not be misled by the simplicity of urinary analysis as it is understood to-day, but that they may appreciate the value of urinary findings in the recognition and management of the various forms of nephritis. On the other hand, it is just to say with Meltzer that erroneous results are often obtained from too fine methods of urine examinations. The fault is not in making careful urinary analyses, but in the interpretation of and the significance applied to such findings. Renal infarcts, commonly seen at autopsies, may simulate acute nephritis, but are characterized by sudden appearance of albumin and blood, without dropsy, and sudden disappearance of the same elements. Febrile albuminuria frequently occurring in typhoid fever, pneumonia, and other acute infections can be distinguished by the quantity and persistence of albumin and casts, and the absence of blood and edema.

Acute exacerbations of a chronic nephritis are recognized by the history and by established circulatory signs rather than by urine studies. In acute nephritis the amount of albumin from day to day seems to be a fair index of the successful management; this is not always true in chronic nephritis, where we have to reckon with circulatory changes, which are the best guide.

The diagnosis of acute parenchymatous nephritis rests on, first, the urinary findings; secondly, edema with fever and its associated phenomena; and thirdly, pallor and headache; but all signs and symptoms may be absent, as has been intimated, and the urine alone be the index of the disease. Sudden edema of the larynx or lungs is strikingly for nephritis, and often the acute form, while cardiac dilatations from degenerative myocarditis and uremia are to be feared, after a diagnosis has been made. Acute parenchymatous nephritis is said to be uncommon in typhoid fever, and this is my clinical experience, yet it is surprising, in going over our hospital records, to find persistent albumin and casts, in cases of typhoid fever which have died, diagnosed

toxemia; while as a possible etiological factor in chronic parenchymatous nephritis, former severe typhoid fever is frequently elicited in history taking.

Chronic parenchymatous nephritis is the commonest type of nephritis coming under our care in hospital work. Patients usually apply because of edema, which makes them more suitable hospital cases than those suffering from the vague symptoms of chronic interstitial nephritis. Of this form of chronic nephritis a study was made of forty cases; all but six were between twenty-five and fifty years of age; eight only were women; sixteen gave a history of previous infectious disease; six of chronic alcoholism; three only of syphilis; one of exposure; and from fourteen no history bearing on the present illness could be obtained. Of symptoms, seven complained of chronic headache; all but five had edema, persistent and general; weakness was complained of by all; fourteen showed marked pallor (probably true anemia, but not verified by blood examinations); fever and pain were absent in practically all; and twelve, or 30 per cent, died, while twenty-eight, or 70 per cent, were discharged improved—that is, free from edema and in fair health. Of the urinary findings, the amount of urine was normal or slightly reduced generally; in two cases it was increased; all but one showed albumin in plus quantities and persistent; all but five had granular and hyaline casts upon repeated examinations; the specific gravity was between 1012 and 1025 in all but eight cases; and only one had uremic convulsions. There were no eye symptoms complained of by any patients, and the few eye-grounds examined were free from albuminuric retinitis. Unfortunately no blood-pressure examinations were made in any of these cases.

From a review of these forty cases one is confirmed in his belief that very few, but positive, symptoms and signs are present in this type of the disease, and the urine examination only helps to confirm a diagnosis which is usually suggested on inspection of the patient alone. In other words, the dropsy is so striking as to leave little doubt of the trouble. As one clinician has put it, chronic dropsy with scanty or normal urine of usual specific gravity full of albumin and casts means chronic parenchymatous nephritis. We might add, with accentuated second aortic sound and increased blood-pressure of slight degree, no case should be misunderstood. Pathologically this is the large white kidney of chronic parenchymatous nephritis.

A word must be said about the symptoms of the small white kidney. This condition occurs usually about the age of thirty-five or over, and is marked by loss of flesh and strength, anemia, headache, faulty vision (retinitis), increased amount of urine with plus albumin, but with no dropsy, and presenting vascular changes and hypertrophy of the heart, with high mortality.

Although only three of my cases gave a history of and showed signs of old syphilis, chronic parenchymatous nephritis is believed to be a common result of this disease, some going so far as to say that exposure is doubtful as a cause, and when not due to scarlet fever, alcohol, or lead, it is usually due to syphilis, the nephritis developing within one or two years after infection. It seems rational to believe that probably toxic agents of a chronic nature are always present in producing this disease, and syphilis as a cause may be of more importance than we have heretofore believed.

In regard to urinary analyses in this type of disease, they seem of less importance than in acute parenchymatous nephritis for diagnosis, but nevertheless should be constantly made for confirmatory evidence.

Cases of chronic interstitial nephritis are rarely treated in a hospital—at least where I attend. I have a record of only ten cases in this study. Eight were over forty years of age (although we must not forget that many cases have been reported in young adults); all com-

plained of indefinite gastric or nervous symptoms or of frequent nocturnal micturition; all showed circulatory changes—hard vessels, accentuated aortic second sound, high blood-pressure, and enlarged hearts; and two only presented eye symptoms. The urine in all was increased, of low specific gravity, with usually only traces of albumin and few hyaline casts. No definite history of a cause could be obtained in any case, the trouble developing insidiously. Of four cases the general health was unimpaired, the patients complaining of vertigo and interrupted sleep. Interstitial nephritis is essentially chronic and is not incompatible with long life and usefulness; it is primary, secondary, or arteriosclerotic, the majority of cases being associated with general arteriosclerosis. The signs and symptoms are the most important, the urine, aside from the amount passed, being practically unimportant. As suggested by Bradford recently, there is danger of excluding disease of the kidney from a study of the urine alone in this type, and the profession should be cautioned to examine carefully the cardiac-vascular system and to consider the general nutrition of the patient. All that we need to know in regard to the urine in chronic interstitial nephritis, as an aid to diagnosis, is the amount passed and the specific gravity. But, if further urine studies are made, significance is obtained only by repeated examinations, and even then is of no practical importance.

Some mention should be made here of postural (orthostatic) albuminuria, which is often functional and is characteristic also of convalescence from the parenchymatous types of nephritis, following prolonged local and bodily rest. Postural albuminuria may in some cases be explained by movable (floating) kidney, when no evidence of nephritis is present, but not always. The very insidiousness of this condition makes the symptoms very indefinite, but the signs of resultant damage are more to the point of diagnosis, but necessarily make an early absolute diagnosis almost impossible, and, in most cases, largely presumptive.

Some one has recently called attention to three types of patients suffering from chronic interstitial nephritis: first, those of advanced years suffering from neurasthenic symptoms; secondly, those presenting signs of ill health and wasting; and thirdly, those with striking pallor and demonstrable anemia. The symptoms of this condition are usually in patients over fifty years of age; they complain of indefinite gastric symptoms, vertigo, weakness, nocturnal dypsnea and micturition; suffer from bronchitis, insomnia, cramps in extremities, tingling, impairment of general health, and wasting, with anemia; but the true condition may be recognized accidentally from failing eyesight and headache, or uremic attacks of a mild nature, or from convulsions. The signs are more definite and usually fix the disease. The increased blood-pressure, often over 200 mm. of mercury (and usually the most striking sign), the accentuated aortic second sound, the enlarged heart, the condition of the eye-grounds, with retinal hemorrhages, the sclerosed vessels of the general circulation, and the abundant urine of low specific gravity, are diagnostic. Finally, in the diagnosis of nephritis of the various types, the value of urinary findings is, first (chemically and microscopically), they are of the greatest value in acute parenchymatous nephritis and are more important than the symptoms and signs; secondly, in chronic parenchymatous nephritis they are only confirmatory to symptoms and signs so striking as to make the recognition of this disease very easy; and thirdly, in chronic interstitial nephritis they are comparatively of little importance.

The *treatment* of all forms of nephritis consists of functional rest, or bodily rest, or both. We have no medicines except to meet symptoms and correct complications, and so these cases are handled best by careful management and diet, the use of a few drugs, and occasionally by surgery.

The phenomena of postural albuminuria give us an index to treatment—that is, bodily rest and local kidney rest. Acute parenchymatous nephritis is managed by long rest in bed, from three to six weeks. Once or twice daily a warm sponge bath should be given. Marvel suggests, for a patient in fair condition, a bath of from 94° to 98° F. with passive motion and friction for from six to eight minutes, after which the patient is wrapped in a blanket and remains in it for thirty minutes; and for feeble patients a pack of from 100° to 105° F. for five minutes, followed by twenty minutes' rest. The amount of liquid per day should be about ninety ounces, as suggested by Von Noorden, and about half that should be water, in my opinion. It is my own practice to give normal saline solution by the mouth, from five to six ounces every three hours, in typhoid fever, pneumonia, and all toxic conditions, and when no edema is present, also in acute nephritis, and despite the objection to sodium chloride in this disease, I have seen only good follow. I appreciate the value of a salt-free diet in edema, and observe care when edema is present in all forms of nephritis. Milk, milk and Vichy, buttermilk, vegetable broth, and an increasing non-nitrogenous diet are suitable. Of medicines, when indicated, I use fresh infusion of digitalis, or liquor ammonii acetatis with a small dose of the alkaloid caffeine (gr. j), being sure to have the last dose of caffeine given not later than four or five o'clock in the afternoon, so as not to interfere with the patient's sleep at night.

The chronic forms of nephritis are diseases in which it is particularly fortunate to be rich. They are usually practically incurable, and we can hope only to establish kidney compensation. In chronic parenchymatous nephritis when edema is present, rest in bed; baths and sweats, from eight to ten minutes, once or twice daily; liquid and salt-free non-nitrogenous diet, although if the general nutrition is suffering our diet should be cautiously more liberal, and gradually increased in amount; water actually measured—that is, about forty-five ounces per day besides other liquids; saline purgatives, and the old Niemeyer pill or caffeine (alkaloid). When kidney compensation seems established and edema has disappeared, the urine normal in amount, and health fair, careful living in a dry, warm climate where the altitude is not great should be the portion of the well-to-do. The patient should bathe every day, wear wool or flannel next the skin, get plenty of sleep, drink about forty ounces of plain or some mineral water per day, have only light employment or exercise, be free from care, have a free stool daily, and measure his urine occasionally. His diet should be definitely prescribed, and better largely a salt-free one. It may be said that the salt output should be studied and the salt restricted rather than cut off, as the animal economy seems to need salt for its proper nutrition. The recent studies of a salt-free diet (the only treatment besides rest in many cases), when edema is present, are interesting and instructive, and I think worthy of consideration. The only drug of use in this stage is iron, and as Tyson suggests, only for the anemia when present. Chronic interstitial nephritis is also a disease for modified rest treatment. The patients are suffering from the damage to the circulation and heart, and should be directed to follow a quiet life, free from care, and guided along the same lines as those suffering from chronic parenchymatous nephritis. One aim should be to reduce blood-pressure, never forgetting that a certain increase above normal is consistent with advanced years and should not be greatly reduced. Of drugs, nitroglycerin, iodide of potassium, or better iodide of soda, in small doses and over a long period, should be tried.

Only one word in regard to uremic convulsons: I cannot agree with my old teacher in this matter, for I give morphine at once when the convulsions occur, irrespective of the type of the disease. I have

also given chloral hypodermically with happy results in uremic convulsions. I have had no experience with surgery as applied to these types of kidney diseases, but after reading Ramon Guiteras's statistics collected from forty-two surgeons where the mortality of operation is 25 to 26 per cent, and only 17 per cent of cures in 160 cases, I am inclined to stick only to medical management.

The Treatment of Nephritis.

By James Tyson, M.D., Philadelphia,
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The object of the science and art to which we are devoting our lives is the prevention and cure of disease. Not so very many years ago cure claimed most attention, was most sought, while prevention played a minor rôle. At the present day while we abate in no way our search for cure, prevention has come to the front and has of late probably been far more successful in checking the ravages of disease than cure.

Bright's disease is no exception to the rule, and I believe I can be of more use to you by dwelling first on measures of prevention. Although we have taken great trouble in the past to distinguish parenchymatous and interstitial nephritis, in point of fact all nephritis, except a few malignant cases of the diffuse form and suppurative nephritis, or surgical kidney, is parenchymatous, by which I mean the process begins in the living cells of the tubules and causes their ultimate destruction and disappearance, to be followed by a substitution of connective tissue. The chief difference lies in the fact that in the so-called parenchymatous nephritis the cell changes are more rapid, though less complete than in the interstitial form, and associated with a primary proliferation and increase of cells, resulting in a pathological product very different in appearance and size, at least in typical cases. In both cases the immediate cause is an irritant acting on the renal cells. The object of the preventive treatment is to avert the irritant, while the object of the curative treatment may be said to subdue the irritant and remove its remote results.

In order to avert the irritant we must know what it is. Its varieties are many and unfortunately are often quite undiscoverable. The best known of them are the causes of the infectious diseases such as scarlet fever, diphtheria, yellow fever, cholera, measles, typhoid fever, rheumatism, and even tonsillitis. Others are overeating and drinking, and especially an excess of proteid ingesta and alcohol, and to a less degree of tea and coffee. To these must be added toxins of the nature of ptomaines generated in intestinal putrefaction and fermentation, all of which throw an excess of work on the kidney cells, resulting in their destruction. The result is imperfect elimination and consequent accumulation of toxic substances, and as the result of these, degenerative changes in the vascular system and in uremia in its various manifestations. As we prevent infectious diseases from occurring and are prompt in their successful treatment, we therefore eliminate nephritis. This covers a large number of cases.

After these come alcoholic excesses and excessive eating, also the ingestion of strong tea and coffee in large quantities. The last occurs more frequently among the lower classes than is commonly supposed. It is not uncommon for the servants of well-to-do families to have tea twice a day, at 11 A.M. and 4 P.M., in addition to the tea and coffee they may take in the morning and evening. By watching such cases as these, therefore, to which almost no attention has heretofore been directed, we may further cut out cases of nephritis, more particularly the chronic forms.

Moreover, there is no doubt that exposure to cold and moisture, whatever its mode of action, whether as a direct cause or favoring the operation of other causes mentioned, is responsible for a number of cases of acute nephritis, as when a man while overheated and perspiring becomes suddenly drenched, or, lying down on the damp ground, falls asleep and acquires an acute nephritis forty-eight hours later.

So much for the preventive treatment; now as to the curative. The further management of nephritis is more easily considered by separating the acute from the chronic form. The treatment of the former is far simpler, followed by prompter results, and more easily disposed of—in fact, in a limited discussion need claim but a few minutes. Absolute quiet, a milk diet of rather poor than rich milk, purgatives, diaphoretics, and diluent diuretics are the measures usually efficient in the average case. For complications, including uremia and dropsy, the same measures judiciously increased are also applicable. I am still timid of the use of morphine for the control of convulsions, although less so in the convulsions of so-called parenchymatous nephritis as contrasted with interstitial inflammation in which the danger is greater, while the difficulty in diagnosis in certain cases makes it no easy matter to decide whether the drug is safe or not. On the other hand, chloroform inhalation to control convulsions, a few drops being placed on a handkerchief for inhalation, is an efficient and safe remedy for this purpose. The effect may be kept up by chloral enemas. As much to be recommended is venesection, followed by hypodermoclysis or intravenous injection of normal salt solution. The latter without venesection may be dangerous, and I pause to emphasize this statement: I think there is danger of overcharging the venous system and precipitating the death of the patient. Nor is it always well to push treatment too rapidly in uremic coma and convulsions. The condition is such an alarming one that we are inclined to try rapidly one remedy after another, when it would have been wiser to make haste more slowly and give nature a chance to assert herself.

A nicer judgment is often required to treat chronic cases than acute. In the first place there are quite a good many chronic cases better without any treatment except a simple hygienic and dietetic course, and this of a not too active kind. These are generally cases which have been discovered by the life insurance examiner, and were previously unsuspected. It is a great mistake to treat such cases actively. I usually say to such patient that it is fortunate the albuminuria was discovered in order that he may intelligently avoid the causes which may make him worse, and that, such precautions being taken, he is no worse off than if he had no albuminuria. Practically the same injunction may be given to similar instances discovered by the physician in a systematic study of a case. Here the advice should be to avoid exposure, fatigue, and overwork, to retire early and seek abundance of rest, along with a minimum but not exclusion of proteid food. Especial stress should be laid on moderate eating of all kinds of food and the exclusion of alcoholic drinks, while the free ingestion of liquids between meals should be encouraged, although this, too, may be overdone. Happily the red meat craze is dying out. I never did join in it. Red meats contain no more nitrogen extractives than white. Boiled meats are supposed to be slightly less injurious than roast, as in boiling some of the extractives are dissolved; but it is a matter of quantity rather than quality.

Warm bathing, especially at bedtime, followed by friction is a useful hygienic measure. It should be daily when possible. Cold sea bathing, especially long submersion, is harmful.

In the matter of medical treatment directed to the kidney, I know of no drug which will create new renal cells to substitute those replaced by connective tissue, but conditions favoring nature's own efforts in this direction are those already mentioned. Our object must be to save the kidney from irritation. There is perhaps even in the mild degrees a tendency to anemia which requires the administration of iron, but this remedy in the shape of the well-known Basham's mixture is too carelessly administered and often does more harm than good by causing constipation and locking up other secretions. I do not give it as much as I used to. Iron should be given in small doses, and I often give the tincture of the chloride in combination with very small doses of bichloride of mercury freely diluted. The bichloride checks abnormal fermentations and the generation of toxic

substances in the stomach and intestines. A regular, sufficient action of the bowels tends to the same end. Purgatives acting on the liver are especially serviceable in ridding the blood of toxic substances. To this end a weekly or biweekly dose of calomel is suitable. The free action of the skin diminishes the demand on the kidney. The iodides dilate the blood-vessels and facilitate the onward movement of the blood, hence some physicians hold that the more or less constant administration of the iodide of sodium or potassium is necessary in every case of chronic nephritis. They are also a good diuretic in most cases. They may have some tendency to remove fibroid overgrowth. I use them a great deal. It is to the next stage, however, in which there is the constant presence of an appreciable quantity of albumin and numerous casts, to which these last remarks apply. You may want to use one of the newer diuretics, of which aceto-theocin is a good sample. It is one of the caffeine group, of which diuretin is also another. They are said to dilate the blood-vessels of the kidney as well as to increase the strength of cardiac contraction. The dose of theocin is three to five grains every six hours. It is a more reliable drug than diuretin, although I have known the latter to act very well, and one must have many strings to one's bow.

The complications of chronic nephritis include the dropsy and uremia of the acute form and call for much the same measures. They are, however, more difficult to relieve and ultimately carry off our patient.

In uremia venesection with hypodermoclysis, purging, and sweating are the sheet-anchors. Another valuable measure is the injection high up in the colon of hot salt solution, three or four times a day, starting with the solution at 110° F. Most efforts in this direction are failures because not correctly carried out. The hips should be elevated, a rectal tube passed high up in the rectum, and the water allowed to run in very slowly. It has even been suggested to have the fluid enter almost drop by drop. In this way large quantities may be introduced, but the temperature of the water necessarily falls. If there is not much edema, some of the hot fluid may be left in the colon; if there is much edema, the limbs may be scarified or Southey's tubes inserted and the water thus run off. Nitroglycerin is a remedy often very carelessly used. It is supposed to have a diuretic effect; I confess I have never seen any reason to believe it has any. On the other hand it is harmless and tends to relieve any high tension that may be present.

Very different is it when we have actually to deal with the high tension of granular kidney. A slightly higher arterial tension than is physiological is necessary to a proper function by a diseased kidney; but high degrees, say a pressure exceeding 160 milligrammes of mercury, are harmful. Here nitroglycerin is of signal service. One hundredth of a grain may be given as often as every two hours until the desired effect is produced. A favorite combination of Sir Lauder Brunton is potassium bicarbonate gr. xxv, potassium nitrate gr. xv, sodium nitrite ½ gr. In the opposite condition of low tension digitalis and caffeine must be substituted, and the sphygmomanometer may be necessary to determine which is present.

Cardiac failure must be added to these complications, increasing and aggravating both dropsy and uremia and being itself sometimes a cause of sudden death. It succeeds upon the hypertrophy so frequently associated with chronic Bright's disease, and is commonly the direct result of dilatation of the heart. Strychnine and digitalis or strophanthus are among the best remedies. In this condition the circulation must not be overloaded with water. The use of water must rather be restricted.

You will want to know what I think of Edebohls's operation of decapsulation for the cure of chronic Bright's disease. I believe the operation has a place in the treatment, but I would not call it curative. Like so many treatments it has disappointed expectation, and probably in consequence is too much ignored. I have thought the better class of surgeons have not given this operation enough consideration, prob-

ably, too, because the conditions supposed to indicate it are so purely in the province of the physician. It is an operation whose suggestion must come almost wholly from the physician, and he is sometimes not as ready to suggest operation as he ought to be. I have seen life saved and prolonged by it, and I am sure this may happen again and again. The cases in which it should be done are generally those of parenchymatous nephritis with extensive anasarca, which refuse to yield to other treatment.

In interstitial nephritis the operation is less hopeful, as there remains less of the parenchyma of the organ to resume its function. There can scarcely be a doubt that the relief comes through diminished tension, illustrated by a case of my own, a typical case of chronic parenchymatous nephritis, in which the patient complained especially of a dull pain in the region of the left kidney along with a sense of aching fulness or distention in the same vicinity—in the patient's language, "a feeling as though there was an abscess there." In the fall of 1906 the kidney was exposed, its capsule stripped, and the organ replaced. In twelve days the patient was taken from the hospital, and a journey of 140 miles was made with very little help on and off the trains. Previous to this there was large albuminuria, dark granular and oil casts. Succeeding the operation he gradually improved, and with the approach of spring began to take advantage of the fair weather to get out-of-doors, then gradually to resume business, until recently he wrote that he feels in as good health as he ever did, and outside of not being as strong as he would like to be, he has no complaints.

With what may be called the organic treatment of nephritis I have had no experience. Indeed, to suppose that nephritis can be cured by feeding its subject with fresh kidneys seems to be so absurd that the idea is repugnant to me. Still I may be wrong. Dr. Oliver T. Osborne in a paper on "Kidney Insufficiency and the Treatment of Uremia"[1] says he certainly has seen "life prolonged in nephritis by feeding fresh kidneys," though he has not had much result from nephritin tablets. He says also that "thyroid extract certainly aids in preventing convulsions in uremia and is," he believes, "the most efficient preventive of that symptom." I have never used it.

The saddest picture in the drama of Bright's disease is that of albuminuric retinitis. It is certainly in the majority of cases the beginning of the end, and the shadow of darkness grows irresistibly until the valley is crossed. Can anything be done to avert it or to diminish it? To avert it there is nothing but what has been laid down in my previous remarks. To diminish it we must at least make an effort by mercurials and the iodides to arrest the process. Patients thus afflicted should be kept on the most stringent diet, and continuously on such doses of the biniodide of mercury, or, better, the iodide of sodium with the bichloride of mercury, as can easily be borne, and all strain upon the eyes should be guarded against. The progress of the disease varies, extending more rapidly in some cases than in others, but I sometimes think the prognosis of the ophthalmologist, who is so often the first to make the discovery, is needlessly grave. One thing I have learned rather late in life which is of extreme importance, and which I would strongly urge upon you, is to insist upon an ophthalmoscopic examination in every case of Bright's disease at least twice a year.

Renal headache is one of the most severe and sometimes gravest of symptoms. It occurs in two forms: first, in the shape of a more or less severe dull pain, often in the occipital region, lasting a variable time; and secondly, a short, sharp, shooting pain, which is often the prelude of uremic convulsions. Both are probably due to the causes of uremia, whatever these may be. The treatment is in all cases eliminative: in the first form, that of the uremic convulsions, at the time; in the second, by more deliberate measures. A remedy of this class very highly recommended by Dr. Samuel West, and with which I have had

[1] *Journal of the American Medical Association*, Aug. 24, 1907.

some experience, is pilocarpine nitrate or muriate, of which the beginning dose is one-twelfth grain rapidly increased to be sufficient to produce an effect on the skin. Dr. West regards it as an efficient remedy in uremia. These headaches are sometimes so severe as to require hypodermic injections of morphine to relieve them; but before this is done, caffeine, nervous sedatives, and counter-irritation should be tried.

The Circulation in Nephritis.

By William B. Stanton, M.D.,
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The close relationship between disease of the kidneys and enlargement of the heart was first pointed out by Richard Bright. Subsequent investigation has confirmed his findings and given rise to many theories which attempt to explain this connection. In order to appreciate the difficulties of the problem, it may be permitted to briefly review what is known regarding the anatomy and physiology of the kidney.

The sectioned kidney surface shows a cortex comprising an outer third which contains the secreting part of the organ—the Malpighian bodies and the convoluted portions of the urinary tubules. The medulla, comprising the inner two-thirds, contains the collecting tubules, blood-vessels, and connective tissue. The blood-supply of the cortex is of special interest. The arteries entering the hilum pass up or toward the surface between the tubules, until they reach the junction of the cortex with the medulla, where they bend sharply to form a series of horizontal arches from which are given off two sets of vessels—one set passing to the medulla which it supplies, the other passing into the cortex. These cortical branches are peculiar. As they pass toward the free surface they give off short lateral twigs, which supply the afferent vessel of the Malpighian bodies. This afferent vessel divides into groups or lobules of convoluted capillaries—the glomerulus. These capillaries terminate in the efferent vessel, which is smaller than the afferent vessel, but still conveys arterial blood. The efferent vessel soon breaks up into capillary networks which surround the tubules of the labyrinth. This second set of capillaries is taken up by the interlobular veins which accompany the arteries. The blood passing through the kidneys thus meets with unusual obstruction because of the two sets of capillaries.

The unit of the kidney is the tubule. This begins as a blind extremity, Bowman's capsule, which is invaginated by and completely surrounds the tuft of capillary vessels known as the glomerulus. These two structures constitute the Malpighian body. After the capsule of Bowman the important parts of the urinary tubules are the two sets of convoluted tubules which are lined with cuboidal epithelium.

There are two chief theories as to the physiological process of the urinary secretion. Bowman thought that the glomeruli secreted only water, while the specific urinary elements were furnished by the epithelial cells of the tubules, to be washed onward by the onflowing water. C. Ludwig assumed a diluted urine was secreted in the capsules. In passing through the tubules the excess of water was removed, and so the ordinary consistency was reached. It is evident that the secretion of urine is much more than a simple physical process, and depends upon the vital activity of the cells concerned. The urine is composed of the urinary water and the urinary elements held in solution. According to Landois, the urinary water is secreted chiefly in the capsules, and the amount depends primarily upon the blood-pressure within the renal artery. The blood-pressure, however, is not the only factor, as the vital activity of the cells of the capsule plays an important part. This vital activity is proven by the fact that the cells become paralyzed by temporary occlusion of the renal artery, and for this reason the kidney no longer secretes, even when the circulation is restored. Another proof is the fact that temperature of the urine is often higher than that of the arterial blood, and while the serum-albumin of the blood is retained, egg-albumin when injected into the blood is secreted. The dependence of the urinary secretion upon the blood-pres-

sure is shown by the increase in urine following increase of the total contents of the vessels. Increase of blood-pressure beyond a certain level may even cause albumin to pass into the urine. Loss of water, as in profuse sweating or diarrhea, causes a diminution in the urine output. Increase in the heart's activity with consequent increase of arterial tension and rapidity of the blood current produce increase of urine, while cardiac weakness causes a decreased output. In animals, artificial stimulation of the vagi, with slowing of the heart and reduction of arterial pressure, caused diminution in the output of urine. When the aortic pressure fell to 40 mm. of mercury, all secretion of urine ceased.

While the quantity of urine depends upon the above facts the concentration depends upon the amount of urinary constituents in solution. These substances appear to be taken from the blood by the independent activity of the cells of the convoluted tubules. This independent activity is shown by the fact that indigo carmine, when injected into the blood, can afterward be found in the cells of the convoluted tubules and not in the capsules. The indigo carmine may also be found in the lumen of the tubules further on, where it has been washed by the passage of the urinary water. If the cortex of the kidney is destroyed previous to the injection of the indigo carmine, this substance is found to remain in the cells of the convoluted tubules. This has also been demonstrated in regard to urea, biliary pigments, the iron salts of the vegetable acids, hemoglobin, and milk.

The nerve supply of the kidney is not completely known. So far only the effect of the vasomotor nerves upon the filtration of urine from the renal vessels has been studied. The nerves for each kidney are apparently derived from both halves of the spinal cord. The center for the renal vasomotor fibers is situated in the floor of the fourth ventricle, in front of the origin of the vagus and very close to the vasomotor center of the liver. Injury to renal vasomotor center, or to any part of the active nerve path, causes vasodilatation with increase of urine. The splanchnic nerve also contains some renal vasomotor fibers. If the splanchnic is paralyzed, there will be a temporary increase of urine which soon disappears because so much blood finds its way to the large intestinal areas. Irritation of this nerve causes the opposite effect. The vagus appears to be the vasomotor nerve of the kidney, and is thought to possess trophic functions as well.

A consideration of the facts just presented enables one to appreciate the very great effect that disease of the kidneys must produce upon the circulation, and especially upon the heart. As already stated, the frequent enlargement of the heart was noted by Richard Bright. He believed that there was a change in the constitution of the blood which acted as an irregular and unusual stimulus directly upon the heart, or that it affected the smaller vessels and capillaries in such a way as to require a greater exertion to drive the blood through the terminal vessels of the arterial system. The cases of Bright, like those later published by Traube, showed that the left ventricle was especially affected. The large number of cases that have been published permit of certain definite ideas as to the frequency with which cardiac hypertrophy occurs in the different forms of kidney disease. Enlargement of the heart occurs most frequently in chronic cases, and especially cases of genuine contracted kidney. It is, however, not always present; the percentage, according to Senator, varying between 50 and 90. In the cases of parenchymatous nephritis, enlargement of the heart may be present, especially when contraction follows. Ordinarily it is infrequent. In acute nephritis of certain kinds hypertrophy of the heart is absent, as in nephritis from arsenic and phosphorus, or that arising in the course of typhoid fever and diphtheria. In primary, acute Bright's, which, according to Krehl, is probably infectious in character, and in scarlatinal nephritis, increased blood-pressure and cardiac hypertrophy are nearly constant. Friedlander (*Archiv für Physiologie,* 1881, p. 168) found hypertrophy and dilatation of the heart in children dying with scarlatinal

nephritis amounting to 50 per cent increase in weight. Those dying of the scarlatina without nephritis showed no enlargement. Four adults, between twenty and thirty years of age, showed no cardiac hypertrophy after death from scarlatinal nephritis.

While the enlargement is most noticeable in the left ventricle, more recent observations have shown that in many instances the right ventricle and the auricles were also affected, according to Krehl, in 82 per cent of those examined by the method of Müller. Investigations of the heart made by C. Hirsch after the method of Müller give a good idea of the average findings. By this method the heart is carefully cleaned of fat, and then divided into its anatomical parts, and the auricles and the ventricles weighed separately. These weights are then compared with the total body weight. In his thirteen cases of contracted kidney the left ventricle was exclusively enlarged four times, with an average increase of 43 per cent above the normal. In seven cases the right ventricle showed a hypertrophy, averaging about 18 per cent above the normal size, while in these same cases the hypertrophy of the left ventricle amounted to an average of 56 per cent. In the remaining two cases the increase was 74 and 129 per cent respectively on the right, and 76 and 188 per cent on the left. Of these cases reported by Hirsch, nine were complicated by an existing arteriosclerosis.

This enlargement of the heart presupposes an increase in blood-pressure, and the results of blood-pressure estimations have been in accord with the pathological findings. The results of Buttermann (*Deutsches Archiv f. Klin. Med.*, vol. 74, 1902) may be taken as a fair example of the usual findings. In eighteen cases of acute nephritis, the elevation of pressure was found to come on quickly—in one case there being an increase of 50 mm. within forty-eight hours after the beginning of the albuminuria. With improvement the pressure returns toward the normal. At the time of the increase in blood-pressure the second sounds of the heart at the base were accented, and there was a heaving apex beat. Occasionally there was dilatation of the heart cavity with or without a muscular insufficiency of the mitral. This dilatation can occur in combination with increased blood-pressure, and according to Buttermann is an evidence that the heart is able to meet the increased demands only in part. In thirteen cases of contracted kidneys the pressure was constantly elevated. In four cases of amyloid kidney the pressure was normal. In thirteen cases of chronic parenchymatous nephritis the pressure was variable—in one group, subnormal; in a second group, normal; in a third group, on the upper bounds of the normal.

The facts in the matter are so well established that a collection of blood-pressure estimations is of little interest. The important question is why does the heart hypertrophy? or what amounts to the same thing, why should the blood-pressure be increased? The theory of Bright has already been mentioned. Other theories have been advanced. Traube thought the obliteration of the numerous blood-vessels in the kidney or their compression by disease products offered resistance to the onflow of blood, while there was also a retention of water in the system which gave the heart more liquid to move in a given time. This theory is defective, because removal of the kidney or ligation of the renal artery has no permanent effect upon the aortic pressure. Also it has been found impossible to raise the normal arterial pressure by injecting salt solution in the veins of animals. Johnson thought the retained material in the blood stimulated the smaller arteries to contraction through the vasomotor system, and thus secondarily increased the work of the heart. He believed that this led to hypertrophy of both the heart and the muscular wall of the vessels. The objection to this is that hypertrophy of the muscular layer of the vessels is not always found. Gull and Sutton thought the kidney disease was merely a concomitant of "arteriocapillary fibrosis" which was the real cause of the hypertrophied heart. Da Costa reported changes in the nerve cells of the renal ganglia and in the lower ganglia of the

cervical sympathetic. The renal disease as well as the cardiac hypertrophy was attributed to this nerve disease. This observation has never been confirmed. For a time it was thought that through the disease of the kidneys a change was produced in the blood by which its viscosity was increased—that is, there was an increase in internal friction, thus augmenting the work of the heart. The researches of Hirsch and Beck (*Deut. Archiv für Klin. Med.*, vols. 69-72) upon the viscosity of the blood in nephritis were unable to demonstrate any increase.

The most tenable theory at the present time is that of Bright, and the majority of observers, as Krehl and Senator, are inclined to believe that the cause of the increased pressure lies in some disturbance or irritation of the walls of the smaller vessels. This alone cannot explain the hypertrophy of the right side of the heart, and Senator believes that the retained excrementitious products may act upon this as a direct irritant.

The facts at our command, then, are that in many instances of kidney disease the systemic blood-pressure is elevated, and the heart hypertrophied. While we are not in a position to measure the pressure in the pulmonary circulation, it is reasonable to suppose that it too is increased, because in carefully examined hearts the right side of the heart is also hypertrophied. This hypertrophy is not due to a failure of the left heart, thus throwing additional work on the right side, because the right-sided hypertrophy is found in hearts with perfectly competent valves, and because the enlargement of the heart is predominantly a true hypertrophy with little or no dilatation.

The theories which have been offered to explain the cardiac results of Bright's disease are incomplete, because the attempts have been made along purely physical and mechanical lines. We have to do with exceedingly complex structures performing different kinds of work in different portions. From the researches already quoted, it is seen that the Malpighian bodies and the convoluted tubules may and do work independently of each other, and presumably either of these may be diseased, while the other remains, for a time at least, practically normal except for secondary effects. Thus the blood passes first through the glomeruli, and from it the capsule secretes water and certain diffusible salts. It then passes into capillaries which surround the convoluted tubules, and from this same blood these tubules secrete the specific urinary elements. It is not hard to suppose that primary disease of these tubules would produce stagnation or obliteration in their capillaries with consequent back pressure upon the glomeruli. It is in this way that a weak heart with following congestion of the kidneys acts to produce diminution of the urine. Disease of the capsules may also occur independently, and the difference in blood-pressure may be due in part at least to the portion of the kidney diseased. While the kidneys may show the most marked changes at autopsy, we cannot be sure that they were primarily affected, and thus produce the circulatory changes, or whether they were not diseased by their efforts to rid the body of some poison. The poison of gout or from lead may produce typical contracted kidneys.

The general increase of pressure must be caused by vasomotor stimulation, but whether this acts directly upon the vessels' walls as does adrenalin, or through the vasomotor center, is as yet unknown. Whether this pressure becomes actually high and hypertrophy of the heart ensues will depend upon the reserve power of the heart and its nutrition. In conditions of low vitality, as in tuberculosis, increase of blood-pressure and cardiac enlargement rarely occur. In the few cases where this was found, the tuberculosis was arrested.

Much stress is laid upon the clinical diagnosis of cardiac hypertrophy in kidney cases. The classical signs are accentuation of the aortic second sound, heaving apex beat, and a hard pulse. If all these are present typically the diagnosis is certain, but the converse is not true. Accentuation of the aortic second sound is a very frequent occurrence in tuberculosis, where the blood-pressure is universally low. This is

most often found in lesions of the right apex, whether they be old or new. The highest blood-pressure record that I have, 260 mm., was in a case seen for Dr. Hobart Amory Hare, and here all the heart sounds were rather weak and the apex beat not palpable. The only certain sign of increased pressure is a blood-pressure estimation with a reliable apparatus.

Finally, a word may be said in regard to the significance of the heightened pressure. I think we have a right to assume that this is a conservative effort upon the part of nature to carry on the functions of the body. If this is so a marked reduction of the pressure by the means of drugs may produce disastrous results. Correction of mode of life and regulation of diet and exercise will aid in maintaining the heart's nutrition, and thus enable it to keep pace with its work. Until we are more familiar with the nature of the poisons or diseases with which we have to deal in cases of so-called chronic nephritis, we will get better results by sustaining the heart than by trying to lower the pressure.

The Surgery of Movable Kidney.

By Dr. J. Chalmers Da Costa,
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The first obligation of surgery is not to do harm. I am certain that in many cases of movable kidney operation is not indicated. The kidney is not normally a fixed organ; it is naturally mobile. It is only when the mobility is excessive that we are justified in regarding it as abnormal. The normally attached kidney moves with each respiratory excursion. This may be demonstrated in any person in whom the organ is palpable; and the lower pole of the kidney, especially of the right kidney, is palpable in many individuals. The right kidney is placed on a slightly lower level than is the left, owing to the large liver above it. It may be felt in thin subjects with relaxed muscles, in whom the ileocostal space is wide. Physiological mobility is demonstrated clearly during operations that expose the kidney, provided the organ is not anchored by inflammatory adhesions.

Whereas some mobility is natural, extreme mobility is certainly harmful. That the fixation of a normally mobile organ may be injurious is probable; that the fixation of an abnormally mobile kidney is necessary seems to be proved. Our first proposition is that a movable kidney should not be operated on at all, unless we are convinced that the mobility is doing harm or is so great in range that it is certain to do harm. If we are sure that there is excessive mobility, and that it is doing or is sure to do harm, and if conservative methods have failed or are obviously useless, we operate. In doing so, we choose the uncertain and lesser evils of fixation instead of the certain and progressive dangers of extreme and increasing mobility.

It is, therefore, evident that in a case of movable kidney a surgeon must, first of all, determine accurately that slight, marked, or great mobility really exists, and whether or not mobility is doing or is certain to do harm. Dr. Harris, of Chicago, has wisely suggested that we should describe three degrees of mobility. The terms that he has introduced are very useful clinically, and I always employ them. The *first degree,* or *slight mobility,* includes those cases in which, perhaps, a considerable extent of the kidney can be palpated, but in which it is not possible to bring both hands together above the organ, when one hand is held in front and the other is held behind. The great majority of cases seen in practice are instances of the first degree of mobility; and in most of these cases I believe that conservative treatment is indicated. The *second degree,* or *marked mobility,* includes those cases in which the hands can be brought together above the organ; and all these cases require operation. The *third degree,* or *great mobility,* includes those cases in which the kidney drops to the pelvic brim or, perhaps, moves to beyond the umbilicus. All these cases require operation.

In examining a patient for movable kidney, I employ the method of Kendal

Franks. The patient is placed recumbent. When the right kidney is being examined, the surgeon stands at the patient's right side, places the four fingers of his left hand in the loin below the twelfth rib, and holds the thumb, with light pressure, in front and just below the ribs. The patient is told to take a deep breath, to hold it a moment, and then, on receiving the command, to empty his lungs slowly. Just before he begins to expire, the surgeon makes an effort to approach his thumb toward his fingers, the thumb being thus pushed up toward the ribs; and as the patient expires the digit follows the rising liver. Even a slightly movable kidney can thus be palpated. If the kidney is movable in the second or the third degree, the organ at the termination of expiration will be caught below the surgeon's thumb and fingers. When this occurs, if the grasp is slightly relaxed, and if the right hand is used to press upon the kidney, that organ will rapidly slip upward between the thumb and the fingers of the left hand, feeling like an object that has been greased.

If the left kidney is to be examined, the surgeon stands at the left side and employs the right hand to make the diagnostic grasp. Instead of using the fingers and thumb of one hand in examining for movable kidney, the surgeon may prefer to place the fingers of one hand in the loin and the fingers of the other in front and below the ribs, giving the patient the same directions as to filling his chest and then emptying it.

Having determined that there is mobility beyond physiological limits, the next question is, How shall we treat the case? In movability of the first degree, without local or general symptoms, there being merely the evidences of hysteria or of a neurotic state, operation is contraindicated. In such cases, anchoring the kidney will not cure the neurotic state. In many of the victims of movable kidney there is a highly neurotic condition, general prolapse of the abdominal viscera, and bilateral renal mobility, the mobility being worse as a rule on the right side than on the left. In such a case, even if both kidneys are operated upon, the general splanchnoptosis will not be cured and the neurotic condition will not be amended.

If, in a case of mobility of the first degree, distinct local symptoms exist and persist, harm to the kidney is threatened or has begun; and if conservative treatment fails, operation is indicated. If the range of mobility is found to be gradually, but certainly, increasing, in spite of non-operative treatment, operation is indicated in order to prevent an otherwise inevitable outcome—that is, the attainment of marked or of great mobility. The deduction from this observation is obvious: it is that a patient with movable kidney of the first degree should be examined at regular intervals, in order that the surgeon may determine whether the range of mobility is increasing.

I have used the term "local symptoms," and it is proper to state what is meant by it. Three local symptoms are of great importance, viz., severe renal pain, distinct renal tenderness, and enlargement of the kidney. Enlargement means the beginning of hydronephrosis. Palpation detects enlargement only when it is considerable. The beginning of dilatation can be detected only by catheterizing and injecting the ureters, and thus finding that the renal pelvis of the movable kidney holds an inordinate amount of fluid. In every case of distinctly movable kidney the ureter should be catheterized. This point has been insisted upon by Dr. Kelly, of the Johns Hopkins Hospital. If catheterization indicates that dilatation has begun, operation is indicated. In every case with marked mobility and in every case with great mobility the operation is indicated, whether there are local symptoms or not, and whether there is dilatation or not. In such cases a let-alone policy will be followed, sooner or later, by trouble. The kidney will inevitably come to grief and undergo structural changes.

In cases in which the kidney is freely movable, a Dietl's crisis may occur at any time. A Dietl's crisis is an attack of pain in the epigastrium, in the loin, or

in both regions. The pain frequently radiates, as does the pain of nephritic colic. There are also nausea and vomiting; tenderness; weakness, or even collapse; not unusually abdominal rigidity; and sometimes nervous chills. Elevation of temperature is frequently noted after such chills. A Dietl's crisis is due to twisting of the renal pedicle, which is productive, as Dr. Charles P. Noble has said, of congestion or hydronephrosis, or of both. There is great variability in the violence and danger of these crises. A slight and temporary twist of the pedicle may simply cause hematuria, albuminuria or casts, renal pain, abdominal pain, or dragging in the loin. A more severe and protracted twist may produce serious hydronephrosis, or even complete obstruction of the renal vessels and ureter. I operated upon such a case during its active stage, and found the kidney in a condition bordering on necrosis. If a definite and positive crisis occurs, others are certain to follow, and operation is positively indicated.

In cases of movable right kidney, I am often in doubt whether a pain in the right iliac region is of renal or of appendiceal origin. Some surgeons would easily and comfortably settle the matter by saying that catarrhal appendicitis is particularly liable to arise in persons with movable kidney, and that the pain of such a patient is appendix pain and calls for the removal of the appendix. I have never been convinced that appendicitis is associated with movable kidney with any particular frequency. In fact, Dr. Howard Kelly states specifically that the observations made at Johns Hopkins Hospital indicate that it is not even very commonly associated with movable kidney. Kelly shows how one may determine whether this pain is renal or appendiceal. He injects the ureter and overdistends the renal pelvis. If such distention produces the characteristic pain in the right iliac region, he concludes that the pain is renal. If it fails to do this, the pain is appendiceal.

If it is decided that the pain is appendiceal, one should remove the appendix, as well as anchor the kidney. The appendix may be removed through a second incision, or both operations may be done through the one incision in the back. I have done this several times, with ease and satisfaction.

Suppose that it is decided to employ conservative treatment, how shall it be carried out? Prolonged confinement to bed, with forced feeding, leads to a deposition of fat, and in some cases to the fixation of the kidney. This form of treatment, however, is possible only in certain individuals.

Any patient being treated conservatively should be cautioned to refrain rigidly from heavy lifting, sudden and forcible movements, and violent exercise. This care is the basis of all success. It is entirely out of the question for any pad to press the kidney into place and hold it there. Such a pad can only be pushed against the kidney by pushing in the belly-wall. If such powerful pressure is continued, it is sure to be harassing and often becomes unbearably painful. If a patient wears such a pad, each increase in intra-abdominal pressure caused by coughing, lifting, straining, etc., lifts the pad away from the kidney and allows that organ to slip below. Then, as relaxation occurs, the pad sinks in, perhaps gets above the kidney, and may actually hold that organ displaced downward.

It thus becomes evident that kidney-pads may be productive of great harm. A broad abdominal bandage is much better than the pad. It lifts other organs up against the kidney, and may thus help to hold that organ in place. I usually employ the corset devised by Dr. Gallant, of New York City, and find it very satisfactory in many cases. Dr. Gallant has placed on record the proper way to apply and to use this corset. My friends, Drs. Rugh and S. S. Cohen, have been using straps of adhesive plaster with very great satisfaction. They use the old-time moleskin plaster, and apply it in a particular manner, by the use of several

strips. They will report their results in a short time.

When a decision to operate has been reached, the next question is, What sort of operation shall be done? To give success, any operation should restore the kidney to—or at least nearly to—its normal place, and should put it in practically its normal relation to surrounding parts. I have recently discussed in some detail the question of operations for movable kidney, and I shall not repeat those arguments here. Suffice it to say that I do not believe that any operation that places stitches through the kidney substance should be employed. They loosen almost immediately, and they may do harm by inducing urinary fistula. I do not believe in any operation that catches the kidney by its rolled-out capsule, so that the convexity of the kidney is anchored to the structures of the back. This position is an abnormal one, puts a quarter of a twist in the ureter, and may be followed by the very hydronephrosis that it has been practiced to avert. The operation that places stitches in the posterior surface and the lower half of the kidney lifts the organ much more nearly into a normal position than do the other methods of suturing, but has a tendency to tilt the upper pole of the kidney forward, a position that is peculiarly unfavorable and apt to cause trouble to the surrounding structures, especially the bile-ducts.

The operation that seems to me to put the kidney most nearly into its normal position and to give the best assurance of solid fixation is that by means of the gauze pads—the operation usually spoken of as Professor Senn's. The objections long urged against this procedure are that it leaves a large open wound, which requires weeks to heal, and that the removal of the gauze, after eight, nine, or ten days, can be effected only after the patient has been anesthetized—as to do it without ether is excruciatingly painful. I have modified the operation by sewing together gauze slings with catgut, and placing the suture-line in front of the replaced kidney. I also partly close the wound in the back and put in several additional sutures, which are left untied. When it is desired to remove the slings a nurse stands by the bed, and during the course of half an hour or longer drips salt solution into the wound. When the slings are pulled upon the catgut lets them come apart. One is not obliged to pull any long end around the pole of the kidney, and the gauze is removed quickly and with very little pain. After the removal of the gauze, a small piece is introduced for drainage. The stitches that were inserted at the time of the operation, but left untied, are now fastened; the stitches that were tied at the time of the operation are taken out. As a rule, the wound in such a case should be healed in from eighteen to twenty-one days. I am convinced that if an operation is done at all, some such procedure as this is the proper one. In conclusion, I would say that I operate on fewer cases of movable kidney every year, and treat more of them every year by conservative methods.

The Treatment of Surgical Affections of the Kidney.

By Edward Martin, M.D.,
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The surgical treatment of the various forms of non-infective nephritis, concerning which there has been a recent wave of enthusiasm, can be briefly dismissed by the statement that decapsulation with the idea of establishing a permanent collateral circulation has been shown to be futile, and that simple nephrotomy has so often seemed beneficial in cases of complete suppression of urine incident to sudden congestion or occurring in the terminal stage of acute parenchymatous nephritis that this operation may be regarded as justifiable as a final measure, since it can be rapidly and safely accomplished, often without anesthesia, or, if pain consciousness be preserved, under local infiltration.

To those familiar with the suddenness with which kidney patients apparently well die, and the equal suddenness with which those apparently dying recover, there is

some hesitation in accepting a few brilliant results as proving the efficiency of a given treatment. That nephrectomy has been followed by such results is undoubted. That such results can be reasonably expected remains to be proven by wider clinical experience.

The evidence in favor of nephrotomy for the relief of nephralgia which has reached a crippling degree of intensity is more convincing. Moreover, operation will usually demonstrate the presence of an adequate cause for such nephralgia.

The same statement holds true in regard to renal hemorrhage of such severity or long continuance as to threaten life. This, if not due to traumatism, neoplasm, calculus, tuberculosis, renal displacement, or hemophilia, is usually an expression of nephritis, which, if not cured by the intravenous injection of human blood serum, calls for an exploratory and usually a curative nephrotomy.

The renal incision for the relief of medical conditions should be placed in the avascular line if this can be found, and should be carried to a depth not greater than half an inch, except in the case of profuse and recurrent renal bleeding, when the pelvis should be opened and the kidney thoroughly explored.

The surgical conditions which call for intervention are, in the order of frequency, calculus, tuberculosis, acute and subacute infections of other forms, both renal and perirenal, excessive mobility, new growths, and ureteral obstruction.

The success of surgical intervention is directly proportionate to the timeliness of surgical treatment, and the lessened mortality in renal surgery, noted in clinics the world through, is due far more to early diagnosis and prompt intervention than to improvement in either operative technique or preparatory or after treatment.

The most satisfactory incision is one starting at the angle made by the crossing of the erector spinæ muscle over the last rib, the cut running obliquely downward and forward toward a point half an inch above the anterior superior spine of the ilium; thence, if more room is required for ureteral exploration or intervention, downward parallel to Poupart's ligament. For simple exploration this incision need be very short. For nephrectomy it is sometimes advisable to carry it more directly toward the umbilicus, severing, if necessary, the rectus muscle.

The position which usually makes the kidney most accessible is that suggested by Edebohls—*i.e.*, in ventral decubitus on an air-cushion 10 inches in diameter when inflated, placed beneath the epigastrium. To allow proper chest action the shoulders should be elevated by sand-bags placed on the table beneath them.

For simple nephrotomy designed for the relief of congestion, as in the terminal stages of nephritis, a cocaine anesthesia is satisfactory. Operations implying stripping of the fatty investment and delivery of the kidney through the external muscular wound call for a general anesthetic. Ether is to be preferred, given in minimum doses. This implies a skilled anesthetist, often the preliminary administration of morphine hypodermically, and the beginning of anesthesia by nitrous oxide.

The delivery of the kidney into the external wound may be easy, difficult, or impossible. A failure to realize the last fact has more than once resulted in the sacrifice of an organ which should have been saved, one enthusiastic and experienced operator having given to a reluctant kidney an impulse so forceful that the organ was propelled entirely across the arena.

For the relief of nephrolithiasis the recent habit of surgeons has been to reach the stone by an incision through the kidney cortex placed in its midportion about 30 centimeters nearer its posterior than its anterior surface, and carried thence directly toward the kidney pelvis. This is the usual position of the avascular area, and is sometimes marked by Brödel's white line. This line is often indistinguishable; and the avascular area may be in the middle line or sufficiently displaced to cause the incision to be attended by profuse hemorrhage. It is therefore well before cutting into the kidney to have its pedicle

under control, preferably by the fingers of an assistant. Where the stone is placed in a not markedly dilated renal pelvis, incision through the renal substance seems an unnecessary traumatism which can be avoided by cutting directly through the posterior pelvic wall. In two recent cases thus relieved of renal stone, followed by suture of the pelvic wound, recovery was unusually prompt, nor was there any leakage of urine. Marked dilatation of the pelvis of the kidney always implies ureteral obstruction; if this be due to cicatricial contraction or causes other than the mechanical blocking of the calculus the removal of the latter through the pelvic wall is surely followed by fistula. Such obstruction should, however, be removed. Its detection and treatment are facilitated by a pelvic incision; nor should the operation of nephrolithiasis be considered complete till the patulousness of the ureter is assured by the passage into the bladder of a full-sized catheter (12 F.).

Stones placed in the calyces are best reached through an incision in the parenchyma. Fortunately the *x*-ray enables us to detect both the number, size, and position of the stones. Hence the tedious and often inefficient probing of the various recesses of the kidney is no longer needful.

If it be recognized that in its early stage tuberculous nephritis is often characterized by a dull and intermitting pain referred to the upper lumbar region, by frequent micturition, polyuria, slight excess of leucocytes in the urine, and occasionally microscopic blood, surgical intervention will begin with an effort to determine the tuberculous nature of the lesion and in which kidney it is placed, since it is usually unilateral.

With the diagnostic phase of the question Dr. Noble has dealt exhaustively. When it has been clearly proven that one kidney is tubercular, the other remaining healthy, in the absence of widely disseminated lesions, the indications are for nephrectomy and removal of the corresponding ureter. The operation is difficult and dangerous only when it is complicated by mixed infection, perirenal involvement, and systemic intoxication. These conditions almost inevitably arise in the absence of surgical intervention. The vesical lesions secondary to tuberculous nephritis can usually be cured after removal of the infecting focus.

Acute and subacute infections of the kidney unattended by pelvic retention are best treated by urinary antiseptics. When, however, a pyonephrosis develops this clearly evidences imperfect drainage through the ureter. In cases of prostatics and those suffering from degenerative spinal lesions the obstruction is usually vesical, and betterment follows relief of bladder retention. Renal operation is in such cases rarely indicated. Pyonephrosis of pregnancy usually subsides after childbirth. A pus collection in the kidney not drained by the ureter calls for incision as soon as the assured diagnosis can be made.

Excessive mobility of the kidney, particularly the right, is so common in thin, long-bodied, neurasthenic women that failure to detect it seems almost abnormal. In the great majority of cases it causes no symptoms and does no harm. When, however, it is associated with a constant or intermittently swollen and tender kidney, and particularly when it is associated with recurring attacks of renal colic, the indications for operation are imperative, if a careful trial of abdominal gymnastics, general sanitary measures, and the wearing of a properly fitting straight-front corset are unavailing.

Of the many operations splitting and turning back of the capsule and its suture to the lumbar aponeurosis is a simple procedure which seems to have given as good results as any. Four to six weeks in the dorsal decubitus, with supporting treatment, are curative factors almost as important as the operation itself.

Ureteral obstruction characterized by uro- or pyonephrosis, when due to irregular pelvic implantation or valve formation, may be remedied by plastic operation or by insertion of the cut ureter into the lowest part of the dilated pelvis. When the obstruction is placed near the bladder the ureter may be cut and implanted in this viscus. In the

case of extensive hydronephrosis reaching well down into the pelvis direct anastomosis between the hydronephrotic sac and the bladder has been suggested. An irremediable uronephrosis calls for nephrectomy.

The surgery of new growths, which are nearly always malignant, remains one of almost hopelessness; this because there are no early diagnostic signs. Profuse, causeless, intermittent hemorrhage of renal origin should always suggest neoplasm. The operation consists of complete enucleation through an incision which gives the freest exposure, since these growths are extremely vascular and often adherent.

Uremia.[1]

By James M. Anders, M.D., LL.D.,
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The subject may be considered under three heads: (1) Pathogenesis of uremia; (2) the symptomatology and diagnosis of the condition; and (3) the treatment of uremia.

1. *Etiology and Pathogenesis of Uremia.*—It is generally conceded that the urea excretion is decreased in uremia, although it does not of necessity follow that the condition is dependent upon its retention in the blood and other tissues. Perhaps the opinion that uremia is due to self-poisoning from toxic substances which are normally excreted by the kidneys—*e.g.*, urea, saline constituents, and nitrogenous extractives—was the one most widely accepted in the past. According to most recent writers (Senator, Strauss, Webster, and others) the so-called retention theory, however, is no longer tenable.

Hughes and Carter,[2] from a critical, deliberate study of the subject, reached the conclusion that the condition is caused by an albuminous product unlike anything found in natural urine. Uremia may develop in many cases without an abnormal accumulation of excrementitious materials in the blood. Not only so, but this condition may be encountered, though rarely, in cases in which the nitrogen output is in excess of the nitrogen intake. Achard and Paisseau[1] have shown that the retained urea is most certainly not the cause of uremia, but these investigators contend that the excess of urea in the blood is merely the witness of the retention of other bodies more toxic than the urea itself.

The primary effect of the retained urea is to induce concentration of the blood, followed by a regulating dilution with increased vascular tension. A further change in some cases at least is an escape of the urea into the adjacent tissue; this calls forth a secondary retention of sodium chloride, which tends to counteract, from a physicochemical point of view, the poisonous effect of an excess of urea. While urea is only slightly toxic, and in increased amount in the blood plays no part in the causation of the associated morbid phenomena known as uremia, it is possible that retention of the mass of excrementitious substances due to perverted metabolism or deficient renal function is the principal factor. Pathologists hold that the extractives constitute 57 per cent of the toxicity of the blood in uremia (Fox)[2]. That an abnormal product of a faulty metabolism of the proteids plays an important etiologic part will be more evident hereafter.

Brown-Séquard has advanced the view that the kidneys produce an essential "internal secretion," which function is disturbed in chronic nephritis. The experimental evidence of Bradford goes to show that the kidneys influence markedly tissue metabolism, especially that of the muscles. No pathogenic connection between a diminished "internal secretion" of renal origin and the symptomatic phenomena of uremia can be shown to exist.

Croftan[3] has pointed out that uremia may be due to non-formation of urea. This position is supported by the fact that

[1] Read before the Medical Society of the State of Pennsylvania at Reading, Pa., Sept. 26, 1907.

[2] *Amer. Jour. Med. Sciences*, August, 1894.

[1] *Seminale Médicale*, Paris, June, 1904.

[2] "Thoughts on Uremia," *American Practitioner and News*, vol. 40, 1906, pp. 407-413.

[3] "An Analytic Study of Uremia, with Some General Conclusions in Regard to its Causes and Treatment," *Jour. Amer. Med. Assn.*, Jan. 6, 1906.

"with a decrease of the urea in the urine and blood we very often find an increase of the ammonia." Obviously, then, disturbance of the hepatic function is a causative factor, since the conversion of the circulating ammonia into urea takes place for the most part in the liver. The question, therefore, is pertinent: Does the hepatic derangement play the principal rôle in the causation of uremia?

Unfortunately, our knowledge of perverted functional activity of the liver is inadequate to base thereon definite inferences and conclusions. It is known that the purin bases are normally converted into uric acid in the liver, and the latter substance into urea in the same organ. It is also conceded that circulating toxins of various sorts, which produce the characteristic changes of chronic nephritis, likewise affect the nutrition of the hepatic cells with consequent disturbance of the liver function.

While the hypothesis that uremia is of hepatic rather than renal origin bears the stamp of great plausibility, our knowledge of the physicochemical links in the metabolic chain of events is as yet quite imperfect. Clinical testimony, however, points to hepatic insufficiency as a factor in the pathogenesis of chronic Bright's disease. It is probable that poisons developed in the liver and the gastroenteric tract are thrown into the general circulation, and on reaching the kidneys induce degenerative changes in the renal cells. Certain cases of chronic nephritis may be caused in this manner. It is not, however, until excretion of toxic bodies, as the result of the advancing kidney lesion, is deficient that uremic intoxication ensues.

In general terms, however, it may be assumed that interference with albuminous metabolic processes, followed by disturbed hepatic function and renal function, explains the etiology of uremia most satisfactorily. Strauss found both the ammonia in the blood and the retention nitrogen in the hydremic serum markedly increased in the uremic subject. Other observers have repeatedly shown that the extractives and alloxur bodies are decidedly augmented in this condition. The connection between these metabolic disturbances and uremia is well expressed by Croftan: "An acid intoxication must be incriminated with producing many of the fulminating signs of uremic, as well as of diabetic, coma. The increased excretion of ammonia under these circumstances may be explained on the basis of a chronic acidosis, for we know that ammonia is thrown into the circulation whenever abnormal amounts of acids begin to circulate; this is a protective process, inasmuch as it aids in maintaining the normal alkalinity of the body fluids and the alkali content of the cells."

2. *The Symptoms and Diagnosis of Uremia.*—In acute uremia the severest nervous symptoms develop abruptly and terminate fatally within a comparatively brief time. Convulsions and coma with fever, feeble heart action and pulse, dyspnea and pulmonary edema, enter into the clinical picture, which is commonly unmistakable. But even this fulminant form of uremia may be heralded by prodromata, which are too often unheeded or entirely overlooked. These are malaise, uneasiness or extreme restlessness, slight dyspnea, nausea, mental wanderings, somnolence, and headache, the latter two features sometimes in alternation. This grouping of mild symptoms should be the signal for prompt and efficient efforts at elimination of the poisonous toxins.

Unfortunately, an examination of the urine does not furnish positive proof of an approaching outburst of uremic manifestations. Various tests have been employed, the results of which are intended to foreshadow an attack of uremia, but these are unworthy of professional confidence. Emerson, Croftan, and others have found that the urea determination in the urine has not been of any value in predicting an acute attack. On the other hand, Herter found in chronic nephritis the urea-content in the blood to range from three or four to twenty times the normal. Again, the microscopic findings

in uremia, while corroborative, cannot be relied upon for diagnosis. The amount of renal epithelium found in the uremic urine is generally small, and at the commencement of a seizure tube casts are commonly scarce. Indeed, I have noted the absence of both albumin and tube casts, with a normal specific gravity, in a few cases in which the symptomatic indications of uremic intoxication appeared. In the absence of any crucial test by which to determine the functional capacity of the kidneys, I earnestly desire to emphasize the grouping of clinical features mentioned above, as a means of recognizing the mild forms of uremic intoxication. In severe, acute uremia an assured diagnosis is easily possible and the condition often well characterized and unequivocal.

In chronic uremia the symptoms are complex, extremely varied, and ofttimes indefinite. In general, however, the marked symptoms of acute uremia are conspicuous by their absence, the milder phenomena of the condition alone appearing, forming a late complication of chronic nephritis and lasting over a considerable period of time. Prostration, more or less marked, feeble heart action, irregularly hurried breathing, transient stupor, often alternating with delirium, slight headache, temporary visual disturbance, nausea and anorexia, and muscular twitching make up a grouping of features commonly observed. From time to time the symptoms that characterize acute uremia—the convulsions in particular—may be superadded, and then the immediate outlook at once becomes quite gloomy.

To gain a thorough knowledge of uremia, a divisional study of its symptomatology is demanded, but the scope of my paper will not permit of a detailed discussion of more than a few leading features. An almost constant symptom of uremia is so-called "uremic" or "renal asthma." It often attends early and may be slight and continuous for a long time in chronic uremia. The well-known nocturnal dyspneic attacks are often confused with ordinary spasmodic asthma, their renal origin being overlooked. In uremic dyspnea, however, the respirations are deep and stertorous, or they may be irregular, accelerated, and shallow, sometimes assuming the Cheyne-Stokes type as in acute uremia. The principal cause of the uremic dyspnea is probably the toxemia affecting the respiratory nervous centers, but for therapeutic reasons it is important to recollect that it may result from cardiac weakness, or pulmonary edema.

The nervous phenomena, especially the convulsions and coma, are often conspicuous in the clinical picture, but the fact remains that in most cases certain nervous symptoms, varying with the individual case, are evidenced for a long period without the intervention of the major accidents of this serious condition. I refer to a class of cases in which one finds certain cerebral symptoms, as headache, tremors, alternating exacerbations of delirium, which may be noisy or even almost maniacal (with delusions of persecution at times), in association with the rather slow, hard pulse of the arteriosclerotic type of chronic nephritis. In another group of cases met with, headache and the evidence of acute indigestion, due to overeating, or the partaking of improper foods, with vomiting, foul breath, and sometimes red, swollen lips, gums and tongue, may precede, and recur at irregular intervals, for months or even years, the more serious accidents of the condition.

The *diagnosis* should be arrived at only after a judicious balancing of the data entering into the previous history of the patient, and the closest scrutiny of all the symptoms and the critical and deliberate exclusion of other morbid conditions with which uremia is liable to be confused. Indeed, it may be stated that in the absence of the characteristic urinary findings of chronic nephritis with gross cardiovascular lesions, individual cases may not permit of a clear and accurate discrimination. But even in cases in which the chemist fails to find in the urine the evidences of gross renal lesions, we are sometimes able to render a diagnosis with a

certain degree of probability by a process of exclusion. Indeed, so far as concerns the nervous symptoms of cases of nephritis, it should be an invariable rule, as pointed out by Leube, to ascribe them to uremic intoxication only after all other causes for the same have been excluded. In this same manner we should also endeavor to recognize the pre-uremic state, and mild, evanescent forms of the disorder.

It is undeniably true, however, that the clinician who in the routine examination of his patients ignores the laboratory methods so well known to determine the condition of the kidneys must often fail to interpret the prodromata of uremia, and the same is true of a large proportion of the cases of chronic uremia. It is practically impossible in view of the nature of the symptoms and pathologic processes, without a chemical and microscopic investigation into the condition of the urine, to arrive at a certain diagnosis. On the other hand, negative urinary findings do not justify an exclusion of uremia. Stevens[1] noted an exaggeration of tendon reflexes, especially the knee-jerks and ankle-clonus, and suggests that this may be a symptom of considerable diagnostic import.

There is a group of cerebral affections which are constantly being confused with uremia, and the most important of these is apoplexy. In apoplexy, however, the convulsions occur late, in uremia they as a rule occur early, preceding the coma, which is sudden and deep in the former, while it may be of gradual development in the latter. Complete hemiplegia is known to occur; it may also be a concomitant of uremia, although it is more likely to be transitory in character. Thus in 10 out of 29 cases of uremic aphasia, reported by David Riesman,[2] hemiplegia occurred. Convulsions may precede the right-sided paralysis, but rarely, as in Hopp's case, they follow the development of aphasia. T. H. Weisenburg[3] reports two cases of uremic hemiplegia attended with alteration in the nerve cells of the brain and spinal cord, associated in one with recent primary degeneration of the central motor tract. The uremic nature of these cases was ascertained by necropsy. Obviously, a discrimination is sometimes impossible during the life of the patient.

Finally, the renal origin of hemiplegia may be inferred, if the urinary findings be those belonging to chronic interstitial nephritis (the urine has to be withdrawn), and especially so if the breath emits a urinous odor and if albuminuric retinitis or dropsy be present. Since cardiac hypertrophy and hardened arteries are common to both conditions, it is clear that a concurrence of these serious states may rarely be encountered.

The occurrence of well-developed acute uremia secondary to the acute infections is to be noted. Herter met with some 14 cases of acute lobar pneumonia in which the end presented the symptoms of the acute uremia, and I have recently seen an instance of the sort. A male, aged forty, afflicted with pneumonia, developed decided stupor, the tongue was heavily coated and dry, the pulse rapid and feeble, and there were muscular twitchings. The urinary findings were those of acute parenchymatous nephritis, although the condition of the kidneys prior to the attack of the pneumonia was unknown. After these symptoms had lasted thirty-six hours a general convulsion occurred. The temperature declined by lysis, and before it reached the normal level the patient had had five moderately severe, general convulsive attacks. A slow convalescence followed.

On the other hand, chronic uremia may closely simulate the picture of severe forms of the acute infections, more especially typhoid fever. Without stopping to reoutline the clinical features of uremia in detail, suffice it to direct attention to a few points of similarity, namely, the prolonged torpor or even actual coma; fever and rapid, weak pulse; heavily coated, dry tongue; and the slight muscular twitch-

[1] *British Medical Journal*, Jan. 16, 1904.

[2] "Uremic Aphasia," *Journal of the American Medical Association*, Oct. 11, 1902.

[3] Proceedings of the Pathological Society of Philadelphia, February, 1904, p. 62.

ings. Fortunately, it is possible to distinguish typhoid fever and other acute infections by means of laboratory tests, by the results of a physical examination, and by noting the symptoms and course.

Uremic coma must also be differentiated from opium poisoning and diabetic coma; this can readily be accomplished in most instances by learning the anamnesis, by carrying out a careful urine analysis, and finally, by an ophthalmoscopic examination in suspected cases of uremic intoxication.

Osler states that patients in chronic uremia succumb to what he has called terminal infections—acute peritonitis, pericarditis, pleurisy, meningitis, or endocarditis. According to my observation, an acute uremia may also develop in the course of, and secondary to, these terminal conditions when they are grafted upon chronic interstitial nephritis, and cause speedy death.

Treatment.—One of the prime objects of treatment is to meet the dietetic, therapeutic, and hygienic indications presented by the underlying acute or chronic nephritis when evidenced by the characteristic symptoms in the given case.

As elsewhere stated, the diet exerts an important influence upon the course and symptomatology, more especially the nervous phenomena of the disease, thus postponing if not preventing the later development of true contracted kidney. In chronic nephritis, a dietary that will meet the requirements of nutrition, plus the loss of albumen that takes place through the kidneys, ranging from one to three drachms daily, should be adopted, but this limit should not be exceeded. On the other hand, the unfavorable effects of an insufficient diet react prejudicially upon the kidney lesions, hastening, rather than postponing, the final stage with its serious complications, including uremia. As will appear hereafter in uremic, and even preuremic, states a greater restriction of diet is indicated.

Any plan of treatment of uremia that does not include prophylactic measures must be considered incomplete. This dictum also presupposes the recognition by the clinician of the premonitory stage, during which there may be noted a variable number of the following symptoms: uneasiness, mental wandering, delirium, nausea, a dry, heavily coated tongue, foul breath, headache, and a tense pulse. These milder manifestations are a signal for diaphoresis, catharsis, and diuresis of the most prompt and efficient sort.

Additionally, nitroglycerin is to be employed freely; it usually brings about a reduction of the vascular tension and renders the second aortic sound less accentuated. In cases in which nitroglycerin fails to decrease satisfactorily the arterial tension, I have found it highly advantageous to combine aconite, which lowers blood-pressure in acute uremia, while at the same time exercising a diuretic and diaphoretic influence. The dosage must be proportioned to the degree of abnormal pressure, but even in cases in which the vascular tension was high, one-minim doses of nitroglycerin combined with two-minim doses of tincture of aconiti radicis, administered every third hour, proved signally successful. Unfortunately, it is, as a rule, impossible to effect elimination through the kidneys owing to the presence of advanced structural changes.

Robinson[1] is inclined to order repeated doses of sweet spirit of nitre, or to add a teaspoonful to a tumbler of water and request the patient to drink a mouthful of it every hour or two to excite diaphoresis. He continues: "The nitre relaxes the arteries (as nitroglycerin and the nitrites), acts as a diaphoretic, and is effective and innocent." I can confirm this statement from my own recent experience. Hot wet packs, or the dry hot-air bath, usually induce copious sweating and prompt elimination of the unknown poisons through the skin. It has been claimed that the electric light bath possesses a decided advantage over the hot packs and dry hot-air baths, in that it promptly induces dia-

[1] "The General Management and Therapeutics of Nephritis," *American Journal of the Medical Sciences*, July, 1904.

phoresis without elevating the temperature of the surrounding air; also that there is greater elimination through the skin and no prostration, so that it may be continued for a long time. Saline laxatives form the best means of accomplishing catharsis: they are to be given in concentrated solution when the stomach is fasting.

Elaterium, or preferably its neutral principle, elaterin, in the form of trituratio elaterini (dose ¼ to 1 grain), may also be used; it exerts prompt action and produces large, watery stools. When the patient is comatose and cannot swallow, intestinal elimination is accomplished with great difficulty.

Pilocarpine has many warm advocates, and its efficacy as an eliminant is undoubted since it acts upon the entire human secretory apparatus. The most eligible preparation is pilocarpine hydrochlorate, which may be administered hypodermically, the dose ranging from ⅛ to ¼ grain. My experience of the use of this remedy is quite limited, and I find myself in accord with the views so well expressed by Forchheimer regarding its employment: "The danger in its use, especially in children, has prevented me from administering this drug in a routine way, and I reserve it for those conditions in which the other diaphoretics and the cathartics do not produce the required effects. I should certainly hesitate to give pilocarpine when there is any danger of development of pulmonary edema, nor should I be consoled if such edema did occur, even though I had added atropine to it."

The diet is to be restricted to articles that give rise to the smallest accumulation in the blood of residual nitrogenous bodies. On this ground I hold it to be all-important to allow only the blandest fluid foods, as skimmed milk, or buttermilk, or even whole milk, preferably hot. In chronic uremia the dieting does not need to be so severely rigorous as in the acute form, and must be determined for the individual case.

It is true, as has been claimed, that there is no precise evidence to show that the sweat or the urine in uremia, after the use of diaphoretics and diuretics, contain any of the albuminoid or alkaloid bodies that must be accused of causing the distressing symptoms of the condition, but I feel strongly that serious and even dangerous uremic manifestations can be averted by the general plan of management recommended above.

When the milder manifestations are not thus controlled, and in all cases of either uremic convulsions or actual coma, heroic measures must, in addition, be brought promptly into requisition. Uremic coma calls loudly for active catharsis. In cases in which high tension is associated, it must be quickly reduced. If the patient in convulsions be robust and plethoric, venesection, withdrawing from 16 to 30 ounces of blood, should be practiced. This measure diminishes the toxicity of the blood, and its efficacy is greatly enhanced by an intravenous counter-injection of large quantities of normal salt solution, which further reduces the toxicity of the blood by diluting it. As a result of these combined measures—venesection and injection of saline solution—cures have been reported, and I have observed one case apparently moribund in which recovery ensued. The operation of bloodletting may be repeated at the end of twenty-four hours if deemed necessary.

The question whether morphine should be prescribed in cases of uremic convulsions is still subject to discussion, although the balance of authority is in favor of its employment. It is generally held to be effective in lessening the number and severity of convulsive seizures. MacKenzie, to whom we owe its introduction as a remedy in uremic convulsions, the late A. L. Loomis, Osler, Delafield, and others, have all warmly advocated its use. Tyson holds that it produces harmful effects in the convulsions of chronic interstitial nephritis, and with this view I am inclined to agree. On the other hand, in acute nephritis and the chronic parenchymatous variety I have witnessed excellent results from its use, hypodermically.

Chloroform and ether inhalations are worthy of a thorough trial in extreme cases, but are less successful than morphine appropriately exhibited. The one leading objection to chloroform and ether is that their effects are too evanescent. Neither do they meet the important indications arising from the etiologic conditions. The convulsions can also be controlled by chloral given by the mouth or by the rectum, in dosage of from 10 to 20 grains if administered by the mouth, or 30 to 40 grains per rectum. This dosage must be repeated, first at half-hour intervals, afterward at one- to two-hour intervals, promptly withdrawing the remedy, however, as soon as the spasms are controlled.

Le Fevre[1] has pointed out that the advantage of chloral over chloroform is that it has a more lasting action, although it merely antagonizes the effects of the causative toxins upon the nervous system.

For the dyspnea which attends and is spasmodic in character and origin, I would advise antispasmodics and nervous sedatives. Respiratory stimulants, as strychnine, atropine, and the like, have failed in my experience to meet this symptomatic indication.

The gastrointestinal group of symptoms may demand the physician's attention. It is to be recollected that they merely indicate an effort on the part of nature to rid the system of toxins. This tendency to self-elimination should be encouraged by lavage, both gastric and intestinal. Astringents are not permissible, but purgatives may be employed, for the double purpose of removing the toxins formed in the intestines and averting their absorption into the general circulation. Obviously, no attempt should be made to arrest a uremic diarrhea.

The treatment as above described is intended to serve as a general guide; it will not be found to be universally applicable, since the symptomatic indications manifest wide differences in different cases. With all our vast hygienic and therapeutic resources, there should be scope for real achievement in the treatment of uremia, but seriously considered the triumphs of our profession in the past and present in this direction are not desirable auguries for the future.

[1]"The Treatment of Uremia," *British Medical Journal*, Nov. 24, 1906.

The Eye and the Kidney.[1]

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The relation of diseases of the kidneys to certain lesions in the fundus of the eye is well recognized; generally these lesions are somewhat loosely grouped under the term "albuminuric retinitis." The object of the present communication is to endeavor to show that this relationship from the diagnostic and prognostic standpoint is a more important one than is usually recognized by many clinicians, that the lesions in the fundus oculi coincident with various types of renal disease do not manifest themselves only in the form of "albuminuric retinitis and its varieties," and to present briefly an account of those ocular manifestations which may be associated with or caused by various forms of Bright's disease, dwelling, however, particularly on those which are of interest to the general clinician. I proceed at once to recount the ocular lesions just referred to; they are:

1. Complete blindness without ophthalmoscopic lesions, or at least without the presence of lesions more or less suggestive of disease of the kidneys, generally called uremic amaurosis, and most often seen in acute nephritis, but also in acute exacerbations of chronic renal disease.

2. Various types of retinitis and neuroretinitis, to which the descriptive term

[1]Read at the fifty-seventh annual session of the Medical Society of the State of Pennsylvania.

Certain other publications by the author on this subject have been freely utilized in the preparation of this paper, notably "Certain Changes in the Vessels and Vascular Coats of the Eye," *Maryland Medical Journal*, June, 1900; "The Ocular Manifestations of Chronic Bright's Disease," *Medicine*, December, 1902; "Concerning the Signs in the Retina of Persistent High Arterial Tension and Their Diagnostic and Prognostic Import," *Ophthalmic Record*, August, 1906; "Intraocular Angiosclerosis and its Prognostic and Diagnostic Significance," International Clinics, vol. i, 17th series, 1907.

"albuminuric" is commonly applied, and which are most often seen in association with chronic forms of kidney disease.

3. Alterations in the caliber and relation of the retinal vessels owing to sclerotic changes in their walls, with or without hemorrhages and exudates in the retina, seen in association with those forms of renal disease in which vascular changes are evident elsewhere in the body; also isolated hemorrhages and exudates, without marked vessel-wall changes.

4. Alterations in the uveal tract, particularly in the choroid and iris.

5. Some varieties of cataract.

6. Paresis and paralysis of the ocular muscles, particularly the superior oblique and the external rectus.

7. Recurring subconjunctival hemorrhages.

Uremic amaurosis, common in acute nephritis, particularly in the nephritis associated with scarlet fever and pregnancy, may also occur in chronic nephritis, which has already produced organic changes in the retina. Indeed, it may occur, as Lawford has well said, in any of the various forms of renal disease in which there is sufficient interference with excretion by the kidneys to load the blood with those poisonous materials, whatever their exact nature may be, which induce the uremic condition. What particularly represents the constitution of these poisonous materials, and what the relation of interference with albuminous metabolic processes and disturbed hepatic and renal functions bears to the etiology of uremia, has already been described in a most admirable manner by my distinguished colleague, Dr. Anders.

In uremic amaurosis the loss of sight usually is sudden, bilateral, and sometimes complete; more rarely the visual disturbance comes on gradually. The pupils are irresponsive to light stimulus in some patients; in others they react normally. With the ophthalmoscope no distinct lesions may be discoverable, or only a slight edema of the retina, except in those cases in which a coexisting chronic nephritis has already produced organic changes in the retina. Whether the blindness is due to a toxin acting on the cortical centers, or to intoxication of the retinal elements, is in dispute. Many clinicians, as well as ophthalmologists, believe that the failure in vision depends upon the action of a toxin directly upon the ganglion cells of the retina. More recently, however, investigations seem to show that it is really the cortical centers upon which the poisonous action falls, proved by the fact that in some of these cases, when sufficient vision has been recovered to make the test, a typical homonymous hemianopsia is present, which could not be explained by the presence of a retinal lesion.[1] So also retention of the pupilary reflex with absolute blindness indicates that the lesion in this condition resides in some portion of the visual pathway beyond the primary optic centers.

The blindness may last from a few hours to a day or more, and the return of sight is usually comparatively sudden, and the condition, except in rare instances, does not lead to permanent blindness, although, as Leber has shown, very occasionally it seems to be the cause of an optic nerve atrophy which develops some time after its subsidence. This, it would seem, indicates that some of the cases are not cortical in origin, but depend upon a retinal ganglion cell intoxication which has lasted sufficiently long to produce a permanent change in the optic nerve elements, precisely as it does after certain other poisons, notably the toxin of diabetes, methyl-alcohol, large doses of quinine, etc.

Retinitis.—That some disturbance of sight may occur in the course of the various types of Bright's disease was known to Bright himself, and was studied pathologically in preophthalmoscopic days. Five years after the discovery of the ophthalmoscope the lesions visible with this in-

[1] Personal communication from Professor Pick, of Prague.

strument were described by Heymann and later figured by Liebreich in his well known Atlas, in the form of a water-color which has since found its way in reproductions in almost all publications on this subject.

The so-called neuroretinitis of Bright's disease may appear as a typical albuminuric retinitis, a degenerative albuminuric retinitis, a hemorrhagic albuminuric retinitis, an albuminuric neuroretinitis, and an albuminuric papillitis.

The typical albuminuric retinitis manifests itself in various shaped and placed white dots in the macula and its immediate neighborhood, sometimes so arranged that a star-shaped figure, or macular figure, is produced, while around the papilla are large, yellowish-white areas forming a striking white region, to which the name "snow bank of the retina" has often been applied. Linear and flame-shaped hemorrhages are scattered over the eye-ground, and particularly noteworthy in the fiber layer of the retina and along the blood-vessels, which in their turn may be buried in the white exudate or pass over it. Three stages are usually present, indicated by the names hyperemic, degenerative, and atrophic.

In the degenerative albuminuric retinitis the white spots are separated by normal areas, the hemorrhages are less conspicuous, and the arteries show patches of sclerosis in their walls. The disk is unduly red, and the star-shaped figure is either wanting or is replaced by white spots dotted irregularly over the macular area. As time progresses the disk assumes a dirty-white, atrophic hue, the vessels grow narrower, and secondary pigment areas appear in the retina. In the hemorrhagic albuminuric retinitis and albuminuric neuroretinitis and papillitis the conspicuous features are in the one hemorrhages, particularly around the papilla and in the nerve fiber layer, and in the other marked swelling with edema and inflammatory signs which swell forward the nerve-head until it assumes the appearance typical of papillitis or choked disk. While systematic writers have recognized these types, they often shade one into the other, and for practical purposes it is sufficient to recognize two great varieties, usually termed inflammatory or exudative, and degenerative.

It is a matter of great importance to determine the earliest signs of renal retinitis, and these may consist in small, insignificant white dots or fluffy exudates, a curious brick-red discoloration of the optic papilla, and alterations in the caliber and walls of the retinal vessels. If the macula is early and much involved, there is also early depreciation of vision, but it must be remembered that disturbance of sight, especially in those cases in which the periphery of the retina is first attacked, is not a conspicuous sign, and it is quite possible to have for long periods of time good visual acuity in so far as test-letters are concerned, even when there is an extensive renal retinitis, and therefore a mere test of vision during the course of Bright's disease is no indication of what the actual lesions may be unless elaborate and careful ophthalmoscopic examination is made. Scotomas, blue-blind areas, alterations in the light-sense, blue-yellow blindness, and, as has been pointed out by Simon, violet-blindness, are not uncommon symptoms in albuminuric retinitis, and the last named disturbance of color-sense, as well as blue-blindness, first described by Gerhardt, have been thought to be more or less characteristic of the disease. As serious late complications, detachment of the retina, hemorrhagic glaucoma, and elaboration of retinal hemorrhages may occur, as well as occasional stoppage of the central artery of the retina, retrobulbar neuritis, and hemorrhages in the sheath of the optic nerve.

Varieties of Renal Disease which Produce Retinal Lesions.—In general terms it may be said that ocular lesions may occur with any form of nephritis, but there is no question that the various types of retinitis

are most frequently associated with chronic interstitial nephritis, that is with renal sclerosis, whether this is an independent primary affection or whether it is a sequel of arteriosclerosis. Various types of retinitis and retinal lesions may be symptoms of chronic parenchymatous nephritis. Some observers, for example Samuel West, make a sharp distinction between the degenerative and exudative forms of albuminuric retinitis, believing that the former is indicative of chronic granular nephritis, and that the degenerative changes depend upon vascular alterations, while the latter indicates a chronic parenchymatous nephritis and depends upon an inflammatory or toxic influence.

Naturally, the so-called secondary contracted kidney, which is a sequence of the large white kidney, may be associated with retinitis. The statement is frequently made that amyloid disease of the kidney produces albuminuric retinitis, and there is no reason why it should not, because lardaceous degeneration of the kidneys is not a separate disease, but purely an event in the course of Bright's disease, most frequently, if I mistake not, occurring in parenchymatous nephritis of cachectic origin. Although uremic amaurosis, to which reference has already been made, is generally seen with acute forms of Bright's disease, there is no reason why an amaurosis of this character should not take place, as, indeed, it not infrequently does take place, during the course of a retinitis caused by chronic kidney disease, as the result, for example, of an exacerbation of the renal lesions.

Date of Occurrence of the Retinal Lesions.—At one time it was supposed that the retinal lesions of renal disease began at the same period that cardiac hypertrophy was manifest, but this certainly is not a constant association. In general terms it is probable that the renal disease must be present for some months before the retinal lesions appear, but the very fact that retinitis may be the first sign of kidney disease, indeed, as already noted, the means by which it is discovered, renders an authoritative statement on this subject all the more difficult. There has been a good deal of discussion as to the existence of the so-called prealbuminuric retinitis, and a number of cases have been recorded—that is, the retinitis, retinal hemorrhages, exudates, etc., have been found to precede the albuminuria by a considerable length of time. Dr. Sutton suggests that these are examples of granular kidney in which albumin is absent, or only present to a very small amount until a later stage of the kidney affection. In other words, it is conceivable that the patient with retinal lesions might consult the physician, as Groenouw suggests, during a period when albumin was lacking, and that therefore these lesions might be ascribed to a prealbuminuric period, although really they appeared during a period when albumin is temporarily absent. On the other hand, lesions especially located in the blood-vessels, particularly various types of perivasculitis and of "silver-wire arteries," producing compression upon under- and overlying veins, are often present for long periods before nephritis is manifest, or at least before other signs of renal disease are fully established—that is, albumin and casts.

Age at which Retinal Lesions Occur.—Inasmuch as chronic interstitial nephritis is a rare disease before the twenty-fifth year, its percentage rising between that age and forty and growing still greater between forty and sixty, the retinal lesions are likely to appear at the same periods. According to Nettleship, the age varies from thirty to sixty, the most prolific single decade being from fifty to sixty. Children, however, are not exempt. In other words, the disease may occur at any age. Reference is not now made to uremic amaurosis—for example, in scarlatinal nephritis—but to so-called typical albuminuric retinitis. The youngest case recorded by Bull in his analysis of 103 cases of exudative neuro-

retinitis associated with chronic Bright's disease was five years of age. Arnold Lawson and G. A. Sutherland have observed this affection in a patient twelve years old, and I have seen one case in a child of nine.

About twice as many cases of renal retinitis occur in men as in women, and it is stated that when decided hyalin thickening of the retinal arteries is evident to the ophthalmoscope, an early stage of granular kidney may be suspected, especially if the patient is comparatively young (Nettleship).

Frequency of Retinal Lesions in Chronic Bright's Disease.—To ascertain accurately the exact proportion of renal disease in which retinitis occurs is difficult, and the recorded percentage has varied from nine to thirty-three. Groenouw has collected from the literature 935 cases of kidney disease, among which there were 209 examples of retinal lesions, namely, 22.4 per cent. According to William F. Norris, fully 25 per cent of the cases of chronic Bright's disease as they occurred in general hospitals are affected by various forms of retinitis. My own experience yields an equally great if not greater percentage, and if one includes not alone the cases in which there are more or less typical forms of retinitis and retinal lesions, but also those in which the ophthalmoscopic signs are comparatively insignificant, consisting chiefly of alterations in the walls of the retinal vessels, this percentage will rise much higher. It is interesting and important that Litten among 33 cases of chronic parenchymatous nephritis six times noted albuminuric retinitis.

Course and Prognosis.—In general terms the appearances of the eye-ground in the various types of renal retinitis have been described, and under treatment there may be subsidence of the neuritis, disappearance of the opacities in the retina, and absorption of the hemorrhages, although I am inclined to think that all of the white spots never subside, and that those in the macular region are the most permanent. The serious complications of secondary glaucoma, thrombosis of the vessels, etc., have been referred to. Therefore the prognosis, in so far as sight is concerned, depends largely upon the character and situation of the exudates and hemorrhages. In some of the exudative varieties, with great involvement of the macula, vision is markedly reduced, although at times florid types under proper treatment clear up very rapidly. An absolute disappearance of the lesions is uncommon and perhaps never entirely occurs, and the physician must be constantly on the lookout for fresh exudates and hemorrhages, which of themselves furnish prognostic indications of the course of the disease. The prognosis *quoad vitam,* if the large statistical material now available is studied, is most unfavorable, and the statement that patients with albuminuric retinitis rarely live longer than two years after its detection, and a very considerable percentage of them die within the first year of its development, is much quoted, but there are many exceptions to this rule, and careful records will show that patients have lived five, seven, and even a greater number of years after the retinal lesions have appeared. In this respect there is a marked difference between hospital and private patients, or between those who can afford the best treatment and those who have to take their chances with less careful therapeutic and dietetic surroundings. The late Dr. Belt collected 155 cases from private practice, of which 62 per cent died within one year, 85 per cent of the remainder in two years, and 14 per cent of the remainder lived more than two years. Of the 75 cases collected from hospital practice, 85 per cent died within one year, 93 per cent of the remainder within two years, and 6 per cent of the remainder lived more than two years. Miley's statistics of 164 patients with acute and chronic renal affection showed 105 with unaffected eyes and 51 with retinitis albuminurica, and that the death-rate of patients with the retinitis

was double that of those who were free from this complication. Now, while the prognosis of albuminuric retinitis will always remain grave, I am satisfied that statistics gathered from now on will show an improvement so far as the duration of life is concerned, as compared with those which are already upon record. This depends upon the improvement in our therapeutic methods. It must be remembered that ophthalmologists often see the lesions of renal retinitis late—that is, they probably have existed some time before their detection—and therefore it is not correct to say that the majority of patients die within two years after the appearance of retinal changes in Bright's disease, but only that they are apt to die within two years after these changes have been discovered.

The *pathological anatomy and pathology* of the conditions just described do not, it seems to me, belong with propriety to the present paper, and they therefore may be dismissed by saying that the so-called renal retinitis depends upon an altered condition of the blood, degenerative changes in the blood-vessel walls, and excessive pressure within these vessels. The retinas themselves are thickened owing to the presence of inflammatory edema, and fatty degeneration of exudates and of the retinal elements is responsible for the alterations in the macula. Perhaps the most important alterations from the pathological standpoint are those which occur in the vessels—that is to say, the same causes which originate disease of the blood-vessels of the kidneys are capable of making similar alterations in the vessels of the retina, and to these alterations the chief rôle must be ascribed in causing the various types of retinal lesions. Indeed, no less distinguished an author than von Michel believes that so-called retinitis albuminurica is entirely the result of a disturbance in the circulation and of lesions in the retina originated by primary disease of the vessel system.

Diagonsis.—Although the word "typical" has frequently been used in the description of albuminuric retinitis, it must not be taken in too literal a sense. In other words, appearances exactly simulating retinitis albuminurica may occasionally be found in syphilitic retinitis, in the retinal hemorrhages of young persons, and in some types of anemia. A very interesting and important fact, pointed out many years ago by von Graefe and other observers, is that appearances identical with those of albuminuric retinitis, even to the formation of the macular figure, may be seen in brain tumor. This observation I have confirmed many times in my own experience, and have quite recently recorded some cases of this character. Rarely albuminuric retinitis is unilateral, at least temporarily unilateral, although usually bilateral before the termination of the patient's life. When the appearances described as typical are present and the exceptions already noted are eliminated, the presence of chronic renal disease is strongly suggested. What I wish, however, to particularly point out is that it is a mistake to suppose that eye-ground examination is negative if those lesions which we have already described as typical are absent. In point of fact, the so-called typical cases are the rare ones, or comparatively rare ones, while the types with scattered hemorrhages, irregularly placed exudates, forms of perivasculitis and early changes in the nerve-head and retinal vessel distribution are the ones that are most startling and most important in their significance, and it is to these that I wish now to call particular attention, under the title of

Alterations in the Caliber and Relation of the Retinal Blood-vessels as a Sign of Nephritis.—For their description I take the liberty of quoting from one of my papers:

The suggestive signs include uneven caliber and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, an unsually light color of the breadth of the artery, and alterations in the course and caliber of the veins.

The pathognomonic signs include changes in the size and breadth of the retinal arteries of such character that a beaded appearance is produced; distinct loss of translucency; decided lesions in the arterial walls, consisting of white stripes in the form of perivasculitis; alternate contractions and dilatations of the veins, and particularly—and this is the most important of the signs—indentation of the veins by the stiffened arteries in the same manner as a solid rod would indent a rubber tube where lying across it. Sometimes the vein is simply flattened slightly at the point of crossing, or merely pushed aside, or its caliber is contracted so that beyond the point of crossing there is an ampulliform dilatation. In addition to these well-known signs, there may be changes in the venous walls, so that they are bordered with white stripes, and the veins may be exceedingly tortuous and contain varicosities. Finally, there are edema of the retina in the form of gray opacity around the disk or following the course of the vessels, hemorrhages manifesting themselves as linear extravasations, or roundish infiltrations, or sometimes assuming a drop-like form.

1. *The Age at which These Signs May Occur.*—As Marcus Gunn has said in his well-known papers on this subject, old age alone does not produce these changes, or does not necessarily produce them in their most elaborate form. Perfectly healthy retinal vessels are often visible in persons who have reached old age, even seventy or eighty years of life. Doubtless the visible changes, again to quote Mr. Gunn, usually begin about forty and fifty. I have seen them, however, at an earlier age, one of the most pronounced examples being a man aged thirty-seven years. Referring to intraocular vascular disease and the nature of the pathological processes at work, George Coats remarks that if all changes which involve thickening of the wall and increased rigidity are included in the term angiosclerosis, it is not entirely a pathological process, but in part a senile change which is naturally present in the vessels of old persons, and in part the result of a pathological stimulus. It is difficult always to separate these two components. Given the stimulus, however, he further remarks, the changes may appear far in advance of the usual age, as, for example, in juvenile nephritis. In other words, as I have elsewhere said, if the cause of persistent high arterial tension is sufficiently prolonged, these alterations may occur at any age at which the pathological condition to excite them arises.

2. *The Earliest Indications.*—The suggestive signs have already been enumerated and must not be disregarded if they are associated with other symptoms of arterial disease. Three signs may be seen early: (*a*) A markedly corkscrew appearance of certain arterial twigs, either of those which skirt the macula, or, more significantly, of one or more small branches which arise from the larger vessels of the main distribution which themselves are apparently normal. A particularly striking manifestation is one not infrequently seen of a single twig which descends vertically from a transverse branch and assumes this corkscrew appearance. This manifestation is the one to which Alleman has given the name "crinkled retinal vessels," and which he figures in somewhat exaggerated degree in one of his diagrams. Such phenomena indicate that the whole artery is not affected, made evident, as has been often noted before, especially by Mr. Gunn, not only with the ophthalmoscope, but, where opportunity afforded, by means of the microscope. Thus, Coats points out that serial sections from the small vessels will frequently demonstrate notable differences within a very short space. For example, in the central artery of the retina the region of the lamina is often selected for the endarteritic process, where the vessel may be almost obliterated, although a few millimeters from this position it is practically normal. What has been termed the irregularity of the distribution of vascular disease in the retinal vessels is, therefore,

well known, both from the ophthalmoscopic and the microscopic examinations.

(*b*) A flattening of a vein where it is in contact with an artery, and at this spot it has somewhat the appearance that a strap would have if laid across a solid tube, provided the vein passes over the artery. If the artery passes over the vein, the appearance is analogous to that which would be produced if the strap were placed across the lower surface of the tube. The vein is only slightly compressed at this stage, but is not yet indented sufficiently to produce an ampulliform dilatation of the vein beyond the point of crossing. It has seemed to me that this appearance is a little more frequent in the inferior temporal retinal vessel distribution than elsewhere, or, perhaps, to speak more accurately, appears there first.

(*c*) The nerve-head has an appearance often loosely described as "congested." But this appearance is different from that presented by the so-called streaked hyperopic disk; it is unlike the flannel-red surface of the papilla which merges into an equally flannel-red eye-ground, so commonly the result of prolonged eye-strain, exposure to bright light and intense heat, or seen in certain constitutional conditions; and, finally, may be distinguished from the early stage of neuritis, with the somewhat juicy-red aspect of the disk. It is a dull-red appearance which is presented, and differs from the franker congestions as the unhealthy flush of a cheek differs from the brighter color of a normal blush. Subsequently the later signs develop—marked indentation of veins, with ampulliform dilatation beyond the point of pressure, varicosities, "silver wire" arteries and perivasculitis, hemorrhages, etc.

Naturally, the significance of the signs just recited pertains especially to arteriosclerosis, and, as I have pointed out in other communications, they represent an importance from the diagnostic standpoint quite equal to, if not greater than, that furnished by a study of the pulse, the character of the first sound of the apex and the second sound of the aortic area, the sphygmogram, and the results obtained by instrumental measurement of arterial tension. But I am not using them along these lines at the present moment. I wish to emphasize that exactly similar appearances are of the greatest importance in the investigation of renal conditions and in summing up our general prognosis. Not only should our thoughts be turned to the prognosis with regard to sight, but how far such a disease may be regarded as an indication of the condition of other organs of the body, and not only of the intimate connection between these ophthalmoscopic changes and cerebral vascular disease, but because they have an important relationship to the study of chronic nephritis, and because they are often seen in many cases in which the usual retinitis has not yet developed. As I have elsewhere said, they are but part of the symptomatology of arteriosclerosis which may be associated with or eventuate in renal sclerosis, and as we know that a large percentage of the cases of chronic interstitial nephritis are primarily arterial in causation, this relationship increases in importance. These retinal vessel changes may be discovered where the usual retinitis may not supervene, because it is possible for them to be significant of a process which may terminate fatally before the development of fully established nephritis.

The other lesions which are found in connection with diseases of the kidney, in so far as the eye is concerned, are largely of interest to ophthalmologists, and I will content myself with reciting a few of them, namely, diseases of the uveal tract, particularly in the form of curious types of disseminated choroiditis and choroidal hemorrhage; certain persisting types of iritis, and if iritis is stubborn and unexplained by other pathological factors, thorough urine examination is necessary; some varieties of cataract, the so-called nephritic cataract, and in the presence of cataract urine examination is essential; and, finally, rare types of ocular muscle palsy, notably paralysis of the superior oblique, external rectus, and other orbital muscle palsies. Paresis of the cil-

iary muscle has frequently been observed. Last but not least in significance are recurring subconjunctival hemorrhages and subcutaneous palpebral hemorrhages. Textbooks are fond of referring to the hemorrhagic phenomena of nephritis, epistaxis, purpura, retinal extravasation, etc., but usually forget these slight subconjunctival and subcutaneous palpebral hemorrhages, often occurring in persons past forty, usually during sleep, and more frequently, I think, in the left eye. They come and go, recur at comparatively short intervals, seem to be very insignificant at the time, and yet are often as significant as the deeper retinal lesions of serious arterial disease in association with nephritic changes.

Treatment.—Naturally, the treatment of the conditions which I have described is concerned chiefly with that which is suited to the disease which has caused them. Speaking particularly from the eye standpoint, I would say that the best results in exudative albuminuric retinitis are reached by the administration of repeated doses of alteratives, the various iodides, biniodide and bichloride of mercury, the suitable administration of vapor baths, and if there is any persistent high arterial tension, the exhibition of repeated small doses of nitroglycerin. In a few cases I have thought that very large doses of the various preparations of iron were efficient, especially iron exhibited in connection with the bichloride of mercury. Local treatment is of no importance, and I have failed to gather from a study of the literature, particularly as it has been gathered by Dr. Suker, that decapsulation of the kidney has any favorable influence on the subsidence of the retinal lesions.

Before dismissing this subject I ask your permission to emphasize certain points.

1. While there is a so-called typical albuminuric retinitis, with star-shaped figure in the macula, hemorrhages and exudates scattered throughout the eye-ground, and the so-called snow-bank appearance around the disk, this is by no means the most frequent manifestation of renal retinitis, which is more often exhibited in the form of congestion around the optic nerve, small, scattered hemorrhages and dots in the macula, and fluffy exudates in the periphery of the eye-ground, which might readily escape detection unless the most searching ophthalmoscopic examination is made.

2. That in a certain percentage of cases, in association with other indications of arteriosclerosis, intraocular angiosclerosis, with alteration in the caliber of the retinal vessels, indentation of underlying veins, slight perivascular changes in the form of the so-called "silver-wire" arteries, is deeply significant of a process which may eventuate in a chronic interstitial nephritis, which has not produced the ordinary so-called renal retinitis.

3. The presence of normal vision does not in any sense exclude the existence of the retinal lesions of chronic Bright's disease, and no patient is properly examined until the ophthalmoscope has been used in expert hands, preferably after dilatation of the pupil with a suitable mydriatic. The ophthalmoscopic revelations, already now many times recited, are so important in the study of every case of nephritis, no matter what its type may be, that a systematic and routine and frequently repeated ophthalmoscopic examination of all patients with Bright's disease at suitable intervals should never be neglected, any more than a similar frequently repeated examination of their urine is neglected, not only because a renal retinitis may appear and develop most insidiously, but because by reason of such development and in the course of such examination the prognosis of the case is suitably checked. Naturally, ophthalmoscopic examination appeals to me, not only in this disease but in all other diseases, but I maintain that for the reasons already recited these repeated ophthalmoscopic examinations are just as important as examinations of the blood-pressure, of the urine, and in general terms of the cardiovascular system in various types of chronic interstitial and parenchymatous nephritis.

EDITORIAL.

THE SYMPOSIUM ON NEPHRITIS.

Without doubt one of the most important conditions which is presented, for the consideration of the general practitioner as well as the specialist, is the pathological changes which arise in the kidneys. The busy practitioner not infrequently finds that efforts to procure relief from certain symptoms are nullified by his neglect to pay a sufficient amount of attention to these important eliminating organs. The symposium upon nephritis which we publish in this issue of the THERAPEUTIC GAZETTE will undoubtedly prove of very great value to our readers, as presenting a complete summary of modern views in regard to renal disease, both from the standpoint of the pathologist, the medical clinician, the surgeon, and the ophthalmologist. Each of the contributors is well known in his particular field and speaks with the authority of experience.

NEW METHODS OF INVESTIGATION IN REGARD TO THE EFFECTS OF DRUGS, WITH ESPECIAL REFERENCE TO THE INFLUENCE OF QUININE.

Although it cannot be denied that a very large part of our employment of drugs in the treatment of disease is still based upon empiricism, it is nevertheless a fact that during the last thirty years extraordinary advances have been made in our conception of the manner in which drugs produce many of their therapeutic effects. By experiments carried out with various forms of blood-pressure apparatus we have gained fairly accurate information in regard to the physiological action of drugs which are known to possess a considerable influence upon the circulatory system, and much work has been done in regard to the effects of anesthetics, and the influence of various drugs upon the secretion of bile and the action of the kidneys.

With the advances which have been made in pathological and physiological research, particularly in connection with the conditions of the blood, new fields of therapeutic investigation have been opened, and these are now being tilled in such a way as to produce crops the value of which may well be said to be inestimable, although as yet the growth is so immature that the full value cannot be calculated.

Of all the investigations which have done most toward clearing up our knowledge of infectious diseases and the means by which the body antagonizes such attacks, the work which has been done by Ehrlich and many other investigators upon the condition of the blood is without doubt the most valuable, and these researches in turn have been advanced by the studies of Wright and his associates in regard to the influence of opsonins, so that at the present time we have fairly clear conceptions of the several methods by which the organism protects itself against invading microörganisms.

It having been found that it was possible to increase the ability of the body to protect itself from invasion by infectious germs through the stimulation of the development of antibodies and opsonins and the activity of phagocytes, it at once became evident that a wide field of investigation existed in regard to the effects which drugs might produce upon these protective processes of the body, and it became clear that many of our therapeutic procedures which have heretofore been regarded as of great value, although purely empirical, might rest upon a sound scientific basis.

The readers of the GAZETTE will remember that we have pointed out in its original and editorial columns at various times that many drugs which heretofore have been supposed to do good by acting as stimulants, in the sense of circulatory and respiratory stimulants, might prove to be not stimulants in this sense at all, but rather in the sense that they in-

crease the ability of the phagocytes to devour microörganisms, or the ability of antibodies to combine with the toxins produced by microörganisms, or the ability of the opsonins to aid the corpuscles in destroying invaders. It was on this basis that a research was published by the writer of this editorial four years ago which seemed to show pretty positively that the administration of alcohol in moderate doses during the course of acute infectious diseases distinctly increased the bacteriolytic power of the serum.

Our attention has been called at this time to two very interesting and valuable contributions upon the action of quinine sulphate in the human blood, one of which is from the Hull Physiological Laboratory of the University of Chicago, by Thomas M. Wilson, published in the *Journal of Physiology* of September 2, 1907, and the other a research by Manwaring and Ruh from the Pathological Laboratory of Indiana University, printed in the *Journal of Experimental Medicine* of September 21, 1907. In the first research, that by Wilson, he studied the action of quinine sulphate on unicellular organisms primarily, and proved, as have many other investigators heretofore, that fairly strong solutions of quinine hydrochloride cause a distinct diminution in the activity of these organisms. It will be remembered that Binz more than thirty years ago showed that quinine distinctly prevented the migration of white blood cells during inflammatory action in a frog's mesentery, and similar results were obtained by the writer of this editorial and were published in a graduation thesis in 1884. In these early experiments it was found that the free diapedesis of leucocytes in an inflamed area was not only checked, but that the white cells which accumulated in large numbers in the capillaries of the affected parts failed to pass through the vessel walls. In Binz's studies the amount of quinine given varied from 0.01 to 0.005 per cent of the animal's body weight.

It is not necessary for us in this editorial to go deeply into the technique of the experiments which were carried out by Wilson. It suffices to state that he found, in addition to the effects already described by Binz and the writer, that the phagocytic power of the leucocytes was very markedly affected by the drug quinine. If large doses were administered it was inhibited, but if smaller doses were given it was very markedly increased, the increase amounting to as much as 25 per cent over normal phagocytosis. The quantity of quinine which produced this increase in phagocytosis was equivalent to about ½ grain circulating into the blood of a man weighing 170 pounds, or, in other words, that quantity of quinine which would probably be taken into the circulation from a dose of from 2 to 3 grains of the sulphate. It is a noteworthy fact that when the doses of quinine were very large, the drug was found not only exercising an inhibitory influence upon phagocytosis, but to be absolutely destructive. Wilson is unable from his experiments to state positively whether this increased ability of the phagocytes to destroy invading microörganisms depends upon the quinine rendering the bacteria very susceptible to the action of the leucocytes, or whether its effect is produced by increasing phagocytic activity; in other words, he has not determined whether the quinine increases the opsonic influence, or whether it has a direct action upon the white cells.

In the research of Manwaring and Ruh similar results were obtained, and as the two researches were entirely independent of one another, one can be considered as the strong indorsement of the other. Manwaring and Ruh not only found, as did Wilson, that quinine caused a stimulation in phagocytosis, but furthermore that large doses diminished phagocytosis, and if the dose was very large, arrested it entirely.

These two researches would seem to throw a flood of light upon certain empirical facts which have been known to the profession for many years. It has been held almost universally by active physicians and surgeons that quinine, whisky, and iron afford the best combination that we have for combating septic infection. If, as proved in the research already referred to, alcohol increases the bacteriolytic power of the serum, and if, as seems to

be proved by the two researches just published, quinine increases the phagocytic power of the blood, it becomes clear why quinine is so efficient a remedy in moderate quantities for combating septicemia, and, in the same way that the use of quinine in malarial fever was removed from an empirical to a scientific basis by the discovery that the drug destroys the parasite which causes this disease, we now have shown that the purely empirical use of this drug for other purposes seems to rest upon an equally sure scientific foundation.

In this connection, too, the facts asserted by these investigators in regard to the difference in effect produced by large and small doses are well worthy of thought. We have long been impressed with the idea that the principle that "if a little is good more is better" in the use of quinine is erroneous. Doses of 30 to 60 grains of this drug, which are sometimes administered in the conditions which we have named, are not only capable of producing manifest evidence of general systemic depression, but as these researches show are actually destructive to one of the chief activities of the body in protecting itself from disease; whereas small doses which are not sufficient to disorder digestion or to cause severe headache may produce excellent results.

In this connection, of course, the question as to the quantity of quinine which enters the blood is to be considered. Those persons who have studied most thoroughly the influence of quinine upon the malarial parasite seem to be convinced that if absorption is active very much smaller doses are required than those which many practitioners have been in the habit of administering. Thus, Thayer asserts that 15 grains given to a patient with malarial infection who is kept in bed at rest, and whose alimentary canal is active, is quite adequate to produce the necessary therapeutic effect. In many instances the condition of the stomach is such that even if 60 grains is given only a very small dose actually enters the blood. Physicians should recognize the importance of aiding in the actual absorption of the drug, remembering that the mere fact that medicine is in the stomach does not prove that it is active in producing its curative effects.

We trust that investigations such as those which we have just quoted may be continued still further, and that the use of a very large number of remedies, which are now employed as a result of practical experience without scientific indorsement, will be placed upon a firm and intelligent foundation.

THE LACK OF THERAPEUTIC VALUE OF CACTUS GRANDIFLORUS.

For a number of years a considerable number of practitioners have been under the impression that cactus grandiflorus possesses certain virtues as a cardiac stimulant, while others have considered that its stimulant effect is feeble, but have believed that it exercised a sedative or regulating influence upon the cardiac viscus. Thus, a well-known practitioner of Philadelphia has been accustomed to employ the tincture, or fluid extract, in cases of cardiac palpitation or irregularity, and while he has frequently combined this remedy with other drugs he has been wont to credit the good results to the cactus rather than to the remedy administered simultaneously. Those who have been most rational in this matter have, however, never believed that cactus possessed very great power, and certain investigations which have been carried on during the last few years seem to prove pretty clearly that even a moderate degree of activity is not possessed by this drug.

The most recent of these contributions is an investigation which has been published in the *Journal of the American Medical Association* of September 21, 1907, by Hatcher, who has studied the effects of the drug upon animals, and who has also gone over, in considerable detail, the literature which deals with this so-called remedy. After proving that the few experimental studies which have been made with it are not worthy of confidence, he proceeds

to detail the results which he has obtained in experiments upon animals, and he finds that cactus and its so-called "active principle" are not only devoid of any influence similar to that of digitalis and strychnine, but that they are inert when used on animals in doses that are hundreds and even thousands of times as large as those recommended by persons who claim that the drug produces excellent results. These conclusions distinctly indorse those reached by Sayre and Houghton which were published in the THERAPEUTIC GAZETTE in 1906. It is remembered that the good results which have been obtained from the use of cactus by certain practitioners may have been in reality due to other causes than the drug itself. The rest in bed which many practitioners wisely recommend to patients with cardiac irregularity is always a powerful factor in recovery, and the psychic influence of taking a supposed remedy from a physician in whom the patient has confidence does much toward diminishing mental anxiety in regard to the heart, particularly if at the same time some sedative like hyoscyamus, the bromides, or belladonna have been given as adjuvants.

THE USE OF TUBERCULIN FOR DIAGNOSTIC PURPOSES.

The editorial columns of the THERAPEUTIC GAZETTE have set themselves so distinctly in opposition to the employment of tuberculin for diagnostic purposes in pulmonary tuberculosis that it is only fair for them to occasionally present views which are in favor of this method of reaching a diagnosis of tubercular infection. It will be remembered that the reason for our opposition to the use of tuberculin originally consisted in the difficulty in obtaining a reliable product, and more important, in the idea that if a patient manifested a sufficient number of signs of tubercular infection to justify us in using tuberculin, then the evidences of tuberculosis were well enough established to make it wise to treat him as if he were a tubercular patient, since if actual tubercular infection had not occurred the patient was at least so fair a mark for such infection that every measure should be taken to improve his health and prevent further disease. Furthermore, it has not seemed justifiable to us, in a large proportion of cases at least, to subject a patient, on what might be called "the border-land of illness," to the reaction, or, in other words, the chill, fever, and sweat, which take place in most tubercular patients when tuberculin is given. There can be no doubt that the use of tuberculin, like many laboratory methods of diagnosis, very materially aids the physician in reaching a diagnostic conclusion, and in certain difficult cases in which tuberculosis is present in other tissues than the lungs its employment is undoubtedly justifiable. In pulmonary cases, however, in the vast majority of instances the careful development of physical signs will lead the physician to a diagnosis without this test.

In a paper in the *Boston Medical and Surgical Journal* of May 30, 1907, Hawes and Floyd point out that in the rush of a large out-patient clinic there is nothing harder than to make what might be called an early diagnosis of pulmonary tuberculosis; yet they appreciate the fact that if the disease is detected in an early stage it offers every chance of a cure or arrest. Under these circumstances, of course, the administration of tuberculin will aid a physician in reaching a diagnosis, but the question is whether a greater amount of time is not lost by the necessary preliminary and subsequent observation of the patient when tuberculin is given, and whether it is justifiable to subject the patient to this loss of time and to the reaction produced by tuberculin simply because there is a rush of work. It goes without saying that these authors are strongly in favor of its use as a diagnostic agent, and they quote with disapproval the statement of Knopf, of New York, that he "is not in favor of using it for the purpose of diagnosticating tuberculosis." They also quote Trudeau as saying that "any danger of aggravating the patient's condition lies in its faulty or irregular administration." There is a good deal in this statement of

Trudeau's. It seems to be pretty well decided by those who employ tuberculin most that it is not an agent which can be used indiscriminately by the general practitioner. On the contrary the infinitesimal doses which should be used at first and the observation of the results which follow seem to be confined to those who may be considered experts, and Dr. Frank Billings very sensibly takes the ground that the use of tuberculin may be dangerous by individuals who do not use other methods of diagnosis which would ordinarily be sufficient. It goes without saying that tuberculin ought not to be used in those cases which are manifestly tubercular, first, because the reaction is disagreeable to the patient, and secondly, because the injection is absolutely unnecessary. Furthermore, it should not be used in cases which have recently suffered from hemorrhage and which have definite signs in the lungs, or which are already febrile. In bone disease and in abdominal tuberculosis it is without doubt a valuable diagnostic agent..

As the result of employing tuberculin in a very considerable number of cases Hawes and Floyd conclude that tuberculin is an agent of very great value in early tuberculosis; that it should be used only as a last resort after all other means of making a diagnosis are exhausted; that it should be used only in carefully selected cases by men properly trained and qualified to employ it; that the initial dose should not be over .1 of a milligramme; that it is best to watch such patients in bed even if they may be "walking cases"; and finally, that if a patient reacts to tuberculin and at the same time has a history and physical signs which leads one to suspect tuberculosis, he should be treated as a tubercular case. It seems to us that these very sensible conclusions meet the indications for the use of tuberculin, and perhaps the most important of them is the second one, namely, that it should be used only as a last resort after all other means of making a diagnosis are exhausted.

In this connection the conclusions reached by Rotch and Floyd, and published in the *Journal of the American Medical Association* of August 24, 1907, are of interest. These investigators studied the relative value of the opsonic indexes and the tuberculin test in the diagnosis of early tuberculosis in children. They conclude that tuberculin is a valuable diagnostic agent in early tuberculosis, but when not used properly is dangerous, and in inexperienced hands may bring disaster, and they regard reaction in children as consisting not only in a rise of one or more degrees of temperature, but in the development within twenty-four to thirty-six hours of headache, nausea, vomiting, and diarrhea, with marked tenderness in the seat of the injection, and the appearance of cog-wheel or harsh breathing, and râles over the suspected area. Indeed, they consider the development of these pulmonary symptoms during a reaction as being of great importance.

We again reiterate what we have said before, that in our experience there are few cases of pulmonary tuberculosis in which the use of tuberculin as a diagnostic agent is essential, and it seems to us that this is particularly true in children, in whom pulmonary tuberculosis is comparatively rare, in whom the development of a reaction scarcely seems justifiable, and in whom the evidences of tuberculosis are usually sufficiently well developed to make it wise to treat the patient as one so affected, even if the diagnosis is not scientifically positive.

SOME PLAIN TRUTHS ABOUT SYPHILIS.

Bulkley, speaking of the extent to which syphilis prevails, holds that the best criterion in regard to this point is to be found in the practice of the dermatologist, since the disease in some portion of its evolution infallibly affects the skin (*New York Medical Record,* vol. lxxii, No. 6, 1907). He notes that of several hundred thousand cases of miscellaneous diseases of the skin compiled from the practice of members of the American Dermatological Association, from various cities all over the

United States, syphilis figures as the causative agent in about 10 per cent. In his own published statistics of 20,000 personal dermatological cases, in public and private practice, syphilis formed over 12 per cent of the number. Arguing from this fact alone it is fair to infer that syphilis is a comparatively infrequent disease, since the total number of patients suffering from any skin lesion of sufficient severity to require a specialist forms a very small fractional percentage of the total population. It is, however, true that the great majority of syphilitic patients suffering from skin lesions do not consult the dermatologist, but are treated by their family practitioners. Therefore these figures are of little use in forming a basis for the calculation of the total instance of syphilis.

Bulkley's second truth is that syphilis is not necessarily a venereal disease. He quotes Fournier to the effect that nearly 25 per cent of females contract syphilis innocently and undeservedly, whilst among married females the disease is unmistakably traced to the husband in 75 per cent of all the cases. These statistics are corroborated by Ricord. Bulkley states that in his private practice a careful study and analysis of his cases reveal that in somewhere near 50 per cent the disease is acquired in an innocent manner wholly apart from sexual transgression. With this estimate most men of experience will agree, though perhaps each will give a different percentage. The fact certainly remains that a large number of people contract syphilis in ways other than by sexual congress.

In regard to the contagiousness of syphilis Bulkley marvels, as do many others, at the existence of a false shame which absolutely prevents any far-reaching public efforts in the direction of prevention.

To the seriousness of syphilis Bulkley accords a just importance.

As to its tractability, this he holds is dependent upon a full and perfect treatment continued until the poisons are eliminated from the system. The two-year limit of treatment he seems to regard as adequate. He cautions against alcohol, even in moderation, holding that an efficient treatment depends upon total abstention. Toward tobacco he is more tolerant, though he believes it had best be avoided.

Mercury, he states, is still the one and only remedy which exercises a specific control over the disease. It should be so given that it permeates the system with the least harm. Bulkley himself usually administers mercury by the mouth up to the point of tolerance. The hypodermic administration of mercury he regards as a valuable addition to our means of combating syphilis in many cases, but does not favor it as a routine method of treatment.

The plain truth in regard to iodide of potassium is that in itself this drug has really no effect upon the syphilitic poison, though it is often erroneously given for this purpose, but as an adjunct to mercury for some of the later results of syphilis it is of inestimable value, and it probably aids materially in effecting the rapid elimination of mercury from the system. Bulkley particularly cautions against the common error of employing potassium iodide alone in the later stage of the disease, and holds, as do nearly all who have had large experience, that more or less mercury is needed as long as there are any manifestations of the disease. He observes that the enormous doses of iodide of potassium which are sometimes given are commonly both useless and irrational.

In regard to the supposed value of mineral springs in connection with syphilis Bulkley certainly voices the opinion of the majority of those most expert when he states that much harm often results from the false security which patients have who have undergone what is called a cure at one of these places. It has been clearly demonstrated that syphilis cannot be cured by any brief course of treatment, however severe. It is true that the cures are distinctly beneficial. This is almost unquestionably due to the active and heroic mercuric treatment to which patients have been subjected combined with change of air and scene, together with the natural hope and expectation of benefit. Bulkley does not recall a single instance in which he has regarded it as either beneficial or

wise for the patient to undertake this cure at any great personal sacrifice.

In this somewhat informal paper Bulkley so well epitomizes the beliefs and practices of those most skilled in the treatment of syphilis that his remarks are worthy of careful consideration. Perhaps the most important truths to which he draws attention are the efficacy of mercury in all stages of the disease and the vital importance of attention to the general health.

THE HYPEREMIA TREATMENT OF SURGICAL TUBERCULOSIS.

In spite of the now very large amount of clinical trial accorded to the Bier treatment by passive hyperemia for the relief of all forms of local infection, it cannot be said that in this country the treatment has received a wide acceptance, nor that it has been attended by uniformly satisfactory results.

It should be accepted as a fact that any form of treatment enthusiastically advocated by an able man who believes in it will not only be practiced by others, but that brilliant, often extraordinary, results will be reported as a consequence of this practice. It is not till results are usually successful in the hands of the majority of practitioners that a given treatment can be regarded as having established its value. In accordance with this standard Bier's treatment must be recognized as still in its experimental stage. This well may be, not because it is wanting in merit, but because it is too often employed by those who lack judgment either in its method of application or in the selection of cases likely to be helped by its use.

Bier's basal principle is the direction of treatment against infection, not against inflammation, which he regards—and indeed so do we all—as desirable, helpful, and in itself protective against the infection. He holds that if he employs such means as increase local inflammatory symptoms rather than diminish them, he is thereby aiding the body tissues in their struggle against the germs.

Thus he is diametrically opposed in his fundamental principles to those who believe that by the elevation of the part, by the application of evaporating lotions, by efforts designed to lessen swelling, heat, and redness, cure is most promptly and efficiently accomplished. The heat, redness, and swelling Bier believes are the indices of natural reaction, and means should be taken to increase them rather than diminish them.

The practical application of Bier's theory lies in increasing the amount of blood in the inflamed area and in retarding the activity of the circulation. This is accomplished by constricting bands so placed as to interfere with venous return.

Schmieden (*Medical Record,* vol. lxxii, No. 7), who has acted as Bier's assistant in the elaboration of the technique, notes that tuberculosis, especially in its joint manifestations, was the first disease which Bier treated with his hyperemia band. There was some difficulty at first in arriving at a correct judgment as to the proper degree of hyperemia and the length of time during which this should be maintained.

Schmieden's description of the technique is as follows: A 2½-inch rubber band is applied slowly and evenly around the extremity, proximally but not too close to the tuberculous joint. Each turn of the bandage overlaps its predecessor. It must be applied so gently that no pain is caused either at the place of application or in the diseased joint. This is regarded as a matter of cardinal importance. When properly applied the extremity below the bandage begins to swell and assume a bluish-red color. It should remain at least as warm as the other limb, and the pulse should remain entirely unchanged. There is thus produced not a stoppage of the blood current, but an increase in volume due to a slight obstruction to the return flow.

In tuberculosis the hyperemia bandage is applied only a few hours a day—one to four hours as a rule, the time being so divided that the band is put on once for an hour or once for two hours, or twice for an hour or twice for two hours. When

the skin is very tender the location of the band is changed.

During the hyperemic treatment all local dressings are removed, and a piece of sterile gauze or towel is placed over the discharging fistula, since a pressure bandage of any sort makes the hyperemic treatment impossible.

Nor should the joint be kept in fixation. When the articulations of the upper extremity are involved the patients are allowed to use a sling for support, and soon are permitted to make slight exercises with the arm, as, for instance, in dressing themselves.

In severe tuberculosis of the knee absolute rest in bed is imperative. With improvement the patient should be gotten up, the joint being protected by a mechanical apparatus which whilst allowing movement prevents pressure. Bier does not regard a stiff joint as a good result, but holds that resection of a joint is, in regard to cure, an illusion. Though he admits that it may cure the tuberculosis, it mutilates by destroying the joint.

The first sign of betterment is the abeyance of pain, which is in itself a certain proof of proper technique. This is followed by disappearance of inflammatory contracture, making active and passive movements possible. In the course of treatment swelling subsides, and large fungous masses are transformed into connective tissue, which later by hyperemic treatment are absorbed. Gradually the contour of the bones again becomes distinctly visible. Tuberculous fistulæ, even though they extend into the joint or bone, close.

Often cold abscesses develop. Bier's treatment for these is by opening and the application of cupping-glasses. Indeed, the formation of a cold abscess indicates a process by means of which the organism casts off the tissue incapable of healing. Its development constitutes no contraindication to the continuance of the congestive treatment.

As to the time required for this treatment, Schmieden states that the patient who desires to be healed quickly must submit to resection or amputation, but that nine months, or even longer, is necessary for the cure of a severe affection of a joint.

Schmieden is evidently an enthusiastic advocate of Bier's principles and practices, and regards as especially in favor of the latter the circumstance that the treatment is so simple that it can very shortly be applied by the patient himself or by any one who is in the house with him. Every ordinarily intelligent patient soon learns to find when the band is properly applied. Experience in a large clinic has shown, according to the author, that this treatment is applicable to nearly all cases. The hip-joint is, however, still beyond reach. The results are particularly favorable in tuberculosis of the ankle, elbow, and wrist. Even such cases as were formerly resected apparently yield readily to treatment, nor is the severity of the disease ever a contraindication to hyperemia.

The treatment is just as effective in the old as it is in the young. As the result of success attending this treatment Schmieden notes that very few resections are done in Bier's clinic, the resections being confined to patients whose general condition is very bad, in whom amyloid degeneration is present, or there is wide-spread tuberculosis of the lungs.

The knee-joint requires special treatment: in the early stage of the disease extension and the application of splints during the time the patient is not in bed, thus supplementing the hyperemia. Those cases in which subluxation of the leg has occurred, or ankylosis between the patella and femur, are better and more quickly treated by resection, since there is then no hope of a movable joint.

The exudative form, so-called hydrops, is never treated by hyperemia. It is aspirated and injected with iodoform emulsion. All cases are radiographed, and even though a bone focus is found its presence in no way contraindicates the treatment by hyperemia.

In regard to the use of the cupping-glasses, these are indicated in all cases of beginning softening and of abscesses which may or may not have fistulous openings. The cups are allowed to remain in place

three-quarters of an hour, but with recesses of about three minutes every five minutes.

The hyperemia must not be too intense. The skin should be red, not blue. The glasses will stay in place if their edges are coated with vaselin. All tuberculous abscesses are opened promptly without fear of mixed infection, since the proper application of cupping glasses will always prevent this. There is evacuated daily through a fistula all detritus, however deeply it may be situated. The pus and detritus having been evacuated, the discharge becomes serous, steadily decreasing, until finally it ceases. Tamponade and drainage are unnecessary, indeed are hurtful, nor is there any other treatment so agreeable to the patient. In all cases of open tuberculosis of joints a hyperemic band is applied daily, twice for an hour, and the cupping-glasses over the fistula for forty-five minutes.

To those familiar with Bier's writing and teaching, particularly his book on "Hyperemia as a Therapeutic Agency," the brief summary of his views and of his practice in regard to the treatment of joint tuberculosis will be without help. To the vast majority, who have not ready access to current literature, or who are so busy earning their daily bread that they have no time for reading, such summarizing of principles as is given in Schmieden's communication is peculiarly valuable. This particular paper shows to any one conversant with hospital services and current literature that the Bier treatment has often been taken up by those totally unfamiliar with either its principles or application, and that the failure resulting therefrom may be justly attributed to this ignorance.

Making due allowance for the enthusiasm of the scientist for his creation, Bier's enunciation in the fifth edition of his book, that "he formerly considered the hyperemic treatment of tuberculosis good, but now considers it the best," should carry considerable weight.

REPORTS ON THERAPEUTIC PROGRESS.

ENURESIS AND FECAL INCONTINENCE IN CHILDREN.

STILL says in the *Clinical Journal* of April 24, 1907, that before deciding on the mode of treatment the urine will have been examined, and his experience has been that, although occasionally some abnormality may be found in the urine, in the vast majority of cases the urine is perfectly normal and gives no guidance whatever. Occasionally a concentrated acid urine may call for the use of potassium citrate; the presence of uric acid crystals may be met by cutting down the carbohydrates as far as practicable—a measure which he believes to be more useful in such cases than cutting off meat and other nitrogenous food, as is usually done; or again, the presence of pus or bacteria in the urine may indicate the need for urotropin or uritone, which can be given to a child of about five years in doses of 4 to 5 grains three times a day.

Far more often an important indication for treatment is found in the presence of thread-worms, and it is often wise even when their presence is denied to give one dose of santonin 1 to 2 grains with calomel 1 to 1½ grains, according to the age, to make this point certain, for there is little chance of stopping enuresis whilst worms are present.

In the majority of cases, however, no exciting cause offers itself for treatment, and then nothing is more generally useful than the time-honored belladonna. But to obtain the best results from belladonna it must be given on a definite plan, and for a period of several weeks. The random bottle of belladonna is responsible for much discredit in the treatment of enuresis. The parents should be given to

understand at the outset that the drug is a potent one, and that the child must be seen at intervals of a few days by the doctor in order that the dosage may be carefully increased as the child is able to tolerate it. If this is clearly understood there is some hope of doing good with belladonna.

Many failures are due to the use of doses which are far too small. The writer has seen cases given up as incurable in which no more than 5 minims of the tincture three times a day had been tried. Children usually tolerate belladonna well, and at any period beyond infancy 5 minims of the tincture should only be considered as an initial dose. If the parents are intelligent and are forewarned of the possible toxic symptoms, it is usually safe to begin with 10 minims for a child over five years of age. The dose should be increased by 2½ minims every fifth or sixth day until either the enuresis is stopped or the limit of tolerance is reached.

If the enuresis is controlled, say, by 17 minims three times a day, it is well to "make assurance doubly sure" by pushing the dose slightly further by an additional 2 minims if tolerance allows. The dose should be maintained at this level, just beyond the minimum efficient dose, for a fortnight, and then reduced by decreases of 2 minims once a week, and so gradually discontinued.

A word of caution with regard to belladonna: children, like adults, have their idiosyncrasies to drugs, and while some will tolerate 30 minims of the tincture of belladonna three times a day, the writer has occasionally met with marked intolerance even of so small a dose as 5 minims. Another caution which applies especially to such a drug is this: see that the dose is measured with a medicine glass, not with a spoon; the domestic teaspoon will often hold two drachms, sometimes as much as three drachms. Nor is even a medicine glass necessarily reliable if it be one of the cheap measures which are often used. The author found in one case that a drachm measured by a cheap medicine glass was actually two drachms, and smaller errors were found to be quite common.

There are many cases in which, after the belladonna has been pushed up to 17 minims or 20 minims with decided diminution of the enuresis, the disorder is still not completely controlled, and yet any further increase of the belladonna produces toxic symptoms which are sufficient at any rate to alarm the parents. Under these circumstances a useful procedure is to keep the belladonna at the topmost dose which is well tolerated, and to combine with it tincture of lycopodium, 12 minims at first, with increases of 2 minims as may be required. A child will usually take 20 minims of this drug without ill effect, sometimes more, and certainly in some cases with most gratifying result.

DISEASES OF THE NASOPHARYNX IN INFANCY.

In writing on this subject in the *Boston Medical and Surgical Journal* of April 18, 1907, MORSE reminds us that adenoids are one of the commonest causes, if not the most common cause, of chronic "snuffles" in infancy. They are also almost always present in those babies that are subject to frequent "colds in the head," and are of great etiological importance in this connection. They are usually overlooked, however, because the baby does not keep its mouth open, snore at night, or have the typical facies of adenoids in later childhood, there being apparently a very general impression that there can be no adenoids, or at any rate no adenoids of importance, unless these symptoms are present. This is not so, of course; frequent colds and chronic snuffles are almost as suggestive and characteristic of adenoids in infancy as those more marked symptoms are in childhood. The treatment of these affections is most unsatisfactory, moreover, unless the underlying condition is recognized. When this is done and the adenoids removed, the "colds" and "snuffles" cease almost immediately. Opera-

tion is not always necessary, however, as mild cases often yield to local astringent and stimulating treatment. The author has found the following mixture very useful:

Iodine, ¼ to ½ grain;
Camphor, 1 grain;
Menthol, 1 grain;
Benzoinol, 1 ounce.

Five to ten drops of this mixture are put into the nose with a dropper every three or four hours. This, by the way, is the best method of making applications to the nose and nasopharynx in infancy. Sprays are of little use at this age because of the fright and struggling which they induce. The drops are best put in with the baby lying on its back so that they may run through into the nasopharynx. Although these cases are so common and the relief from proper treatment, especially from operation, is so striking, it hardly seems necessary to give illustrative cases, as the condition is easily recognized if it is only borne in mind.

Adenoids not only cause "snuffles" and "colds," but also very frequently an irritating cough without physical signs. This cough is especially troublesome at night. Here again treatment, unless the real source of the trouble is recognized, is of no avail. Cough mixtures and throat sprays are useless. The cough can only be controlled by stupefying the infant with bromide or paregoric. Treatment of the adenoids or their removal, however, is almost immediately successful.

THE TREATMENT OF MALARIAL FEVER.

VANDERHOOF, in the *Journal of the American Medical Association* of April 20, 1907, asserts that in the treatment of the individual case emphasis must be laid on the following points: (1) The quinine must be absorbed and enter the blood. (2) The drug must be administered until every parasite is destroyed. (3) The patient should remain in bed until the temperature reaches normal and remains normal.

In order that the quinine may be absorbed there are two essential features to which attention must be directed: (1) The patient's alimentary tract should be in a condition to favor absorption. To this end the bowels must be unloaded, followed by a saline. The diet should consist of soft, easily digested foodstuffs, and as long as there is fever liquid diet alone is preferable. (2) The quinine must be given in a soluble form. In this connection the writer cites briefly a rather remarkable case that came under his notice a couple of years ago. A man was brought into the hospital in a state of collapse whose blood presented an extreme picture of pernicious malaria, nearly every other red cell containing one or more parasites. He died in a few hours in spite of heroic treatment, and at the autopsy was found an ischiorectal abscess which contained in its pocket-like recess a very large number of quinine pills which had passed through the intestine without being at all dissolved. Such an experience as this is certainly striking enough to condemn forever the administration of quinine in pill form. Undoubtedly the surest way to give quinine is in solution with a mineral acid—*e.g.*, quinine sulphate 5 grains, dilute hydrochloric acid 5 minims, water to 1 drachm. It is not very palatable, although the acid seems to offset somewhat the bitter quality of the quinine, and the writer has always found that patients take it without objection. The drug may be administered in powdered form in soft gelatin capsules, but it is not an uncommon experience to have them pass entire from the rectum. The solubility of the quinine when given in this form is aided by following the dose in a few minutes by 10 minims of dilute mineral acid. The best indication we have that the quinine is absorbed is the subjective sensation of ringing in the ears, and if this is lacking we may feel quite sure that the quinine is not in the blood, except possibly in certain unusual cases of idiosyncrasy in this regard.

The necessity of giving quinine for a definite period after the fever and symp-

toms have disappeared is not always sufficiently appreciated. Last fall the writer had several patients brought to him who gave a history of chills and fever five or six weeks previously, who had been given quinine for a few days, which caused the symptoms to abate, but they have never felt quite well since, complaining chiefly of periodic headache, malaise, and occasional chilly sensations, and on examination the blood still showed the plasmodium. A good general procedure in the handling of ordinary cases is the following: 5 grains of quinine every four hours, or 20 grains a day, for the first five days; then 2½ grains every four hours, or 3 grains three times a day, for two and a half or three weeks. In severe cases larger amounts may be given, 30 to 40 grains daily. It is generally advisable to give one large dose, 10 or 15 grains, five hours before an expected paroxysm, and if this is done there is usually sufficient quinine in the blood to destroy most of the young hyaline forms that are produced by segmentation during the chill. But if a case is seen directly after the rigor and another is not expected for two days the author much prefers to start the quinine at once, as it is undoubtedly true that a certain number of parasites are destroyed by the quinine while still contained within the red corpuscles, and the succeeding paroxysm is much modified. Let it here be again emphasized that quinine is a specific in malaria, that if it enters the blood in sufficient quantity the fever should disappear in a few days, certainly within a week, and the writer doubts very much whether it is possible under these conditions for malarial fever to run as long as thirty days, a remark that is sometimes heard. Dr. Carter in a communication touches directly on this point, as in over 200 cases of estivo-autumnal fever treated in the canal zone at Panama the average duration of fever was only fifty-two hours in this severe type of infection.

In pernicious malaria every means should be employed to get the quinine into the circulation as quickly as possible. The drug must be given hypodermically—or, rather, intramuscularly—or even intravenously, and may also be given by the rectum. Tyson objects to the hypodermic method, stating that he has had to abandon it on account of the frequency with which it is followed by abscess formation. Undoubtedly quinine is very irritating to the tissues, but if the precaution is taken of injecting it deeply into the muscles and not simply under the skin, abscess formation is less often encountered—at least this has been the experience in Panama, where this method is frequently used. The bimuriate of quinine, or the bisulphate of quinine and urea, are the two preparations most frequently used. These methods of administering the drug are dealt with in most text-books on the subject.

The necessity for absolute rest in bed while actively combating the infection must be apparent to any one who has tried the simple experiment of treating an ordinary case of tertian malaria by this means alone without the use of quinine at all. While by no means the best way to kill off the parasites, yet it is surprising to see what nature can do when aided by rest, diet, care of the bowels, and general hygienic measures. It is very certain, however, that the rest plus the quinine is more efficacious than either alone.

Appropriate means should be employed during the paroxysms to make the patient as comfortable as possible—blankets, hot-water bottles, and possibly a hot whisky-and-water drink. The judicious use of morphine is often indicated, especially if there is much gastric disturbance. A tepid sponge or an alcohol rub is appreciated during the sweating stage.

The postmalarial anemia is best treated with some form of arsenic. The author usually prefers Fowler's solution, running up to 10 or 12 minims three times a day, provided the patient takes it well. Some prescribe a combination of iron and arsenic in pill form. If there is any indication to continue quinine, such a tonic as the syrup of iron, quinine, and strychnine phosphate may be given.

THE PHARMACOLOGY OF ETHYL CHLORIDE.

Dr. E. H. EMBLEY, honorary anesthetist to the Melbourne Hospital, has contributed to the Royal Society the results of an experimental study of the pharmacology of ethyl chloride with the view of saving what appears to him to be a valuable anesthetic agent from coming under the suspicion of being unduly dangerous. These results arrive at an opportune moment, when the merits of ethyl chloride are so much under discussion. For comparison with the effects of chloroform Dr. Embley used dogs in his experiments, and employed morphine and ether as the preliminary anesthetics. The solubility of ethyl chloride vapor in water at normal pressure and 21° C. was found to be 253.36 per cent by volume (0.678 per cent by weight); its solubility in blood was found to be approximately 500 per cent by volume of the vapor at 38° C.

Dr. Embley next determined the effect of ethyl chloride upon the heart isolated from the central nervous system by a special method of ligation of the arteries, by means of which a circuit was maintained without the introduction of cannulæ. It was found that the heart muscle is paralyzed by ethyl chloride, as by chloroform and in contrast with ether, but the quantity of ethyl chloride vapor in the air required is nineteen times as great as that of chloroform to produce similar results.

The effect of ethyl chloride upon the vascular system was then investigated. The net result is dilatation, but the degree of paralysis is strikingly less than that produced by chloroform, even when the latter is present in less than one-tenth the quantity in the air inspired.

From a study of the effect of ethyl chloride upon the vagus mechanism Dr. Embley concludes that vagus inhibition of the heart occurs very readily when ethyl chloride vapor of a strength of 10 per cent and upward in the air inspired is administered. A sudden fall of blood-pressure occurring when the air inspired contains from 10 to 20 per cent of ethyl chloride is due to vagus inhibition of the heart. When the strength is increased to 30 per cent and upward the fall of pressure is due to weakening of the cardiac and arterial musculature. Dr. Embley is of opinion that cardiac inhibition is not so serious from ethyl chloride as it is from chloroform, since it comes on before the spontaneous excitability of the heart has been much depressed. It does not seem possible permanently to arrest a dog's sound heart under ethyl chloride narcosis by vagus inhibition. It requires nineteen times more ethyl chloride to produce a given degree of cardiac depression than is required of chloroform, whilst it requires only four times as much to produce cardiac arrest by vagal stimulation, hence inhibition sets in relatively rapidly. Dr. Embley considers that these facts explain the relative safety of ethyl chloride. It was also observed that the cardiac inhibition is not a reflex but arises from central stimulation. There was no evidence of any paralysis of vagus endings such as was described by Cole. Dr. Embley further shows that in ethyl chloride narcosis the integrity of the respiratory mechanism is dependent upon the maintenance of blood-pressure, as in the case of chloroform. Paralysis of respiration may be preceded by shallow respiratory movements, but it is usually preceded by deep and delayed breaths, and in some cases the prolonged pause prevents the fall of blood-pressure. In all the experiments the respiration failed before the heart. A strength of from 5 to 7 per cent of ethyl chloride vapor in the air respired appears to be the limit of safety from danger of syncope in dogs for prolonged and continuous administration. If this concentration be exceeded it is inadvisable to continue the administration beyond abolition of the corneal reflex, as otherwise syncope is very probable.

Dr. Embley considers that these conclusions with regard to the effects of ethyl chloride upon dogs apply to man. He has observed the occurrence of syncope in man in two cases, in each of which recovery took place suddenly. From analogy with experimental results he regards such syncope as due to vagus inhibition, except in cases of failing heart and other morbid states. A

sound heart is able to free itself from vagus inhibition, but the degree of depression caused by ethyl chloride may be sufficient during the period of syncope to embarrass an unsound heart beyond recovery.

As regards the administration of ethyl chloride, Dr. Embley advises the employment of a gasometer containing the mixture of air and ethyl chloride vapor. He considers that less safety is assured by the use of any apparatus by which the anesthetic is sprayed or poured into the instrument between the face-piece and the bag, whereby during inspiration excessively high degrees of concentration of ethyl chloride may be given. It is better, he asserts, to mix the anesthetic with the air at the end of the bag.—*Lancet,* April 20, 1907.

ON THE USE OF A NEW FLUID FOR THE HEMATOCYTOMETER.

To the *Lancet* of July 13, 1907, EDINGTON contributes a paper in which he states that of all the fluids in use—and there are a considerable number—the best that can be said of them is that they make an approach to being isotonic with normal blood. "A solution containing just a percentage of salt as suffices to keep the corpuscles unaltered in form and without removal of any of their hemoglobin is 'isotonic.' For human blood a solution of common salt is isotonic with 0.9, for defibrinated ox blood with 0.6, and about the same for frogs' blood. Very slight differences of external condition will tend to alter the permeability of the blood-corpuscles both for hemoglobin and for other substances" (Schäfer's "Text-book of Physiology").

The normal specific gravity of the blood in a healthy subject is from 1058 to 1062, but in departures from the normal the specific gravity may be much lower, and has been found even so low as 1033. With a lower gravity the hemoglobin falls in an almost constant fashion, so that while with a specific gravity of 1057-60 there may be 85 to 95 per cent of hemoglobin, with a specific gravity of 1033-35 hemoglobin will have fallen to 25 to 30 per cent. When coagulation is prevented the corpuscles of drawn blood very soon sink, leaving the yellow plasma as a supernatant fluid, and it is evident that if hemoglobin is given up by the corpuscles to the plasma it is very soon eliminated from that fluid, most probably by the kidneys. In various kinds of experimental hemolyses the author has found free hemoglobin in the plasma antecedent to its appearance in the urine. It is probable, therefore, that changes in the amount of hemoglobin are in great part due to abnormal permeability of the corpuscles and also to their destruction. In any case, supposing the blood to be examined to be that of an abnormal individual, we may assume that the specific gravity is almost certainly below the normal. If this be the case, then the use of a fluid which is isotonic for healthy blood is almost certainly improperly constituted for a blood of lower specific gravity. It seemed to the writer, therefore, of some importance to determine whether one could not prepare a fluid which, without having great regard to the isotonic quality, would be useful for any kind of blood.

Some ten years ago he first used neutral citrate of potassium as a means to maintain large quantities of pathological bloods in a fluid condition so that they could be used for inoculation, and the plan he then adopted has, since that date, found its way into most bacteriological institutions. What, however, struck him as remarkable was the fact that the red blood-corpuscles maintained their shapes and characters in a marvelous manner, so that even blood films could be made with blood so prepared. He has therefore prepared the following solution for use with the hematocytometer: neutral citrate of sodium, 7.5 grammes; formalin (40-per-cent), 2.0 cubic centimeters; dahlia (Grübler's), 0.03 gramme; chloroform, 5 drops; and distilled water, 250 cubic centimeters. In preparing the solution it is better to mix the stain with the water, rubbing down the former with a few drops of the latter first, then to add the citrate and formalin. The solution should be left for a day or two

without filtering, so as to deposit all the less soluble portions of the dye. The solution is easily made and keeps well when kept in a dark and cool place. If, however, it has not been used for some time it is advisable to filter off a small portion for immediate use. In less than a minute after the diluted blood has been placed on the slide one will find the red corpuscles deposited on the glass so completely that nearly all are in focus, while the refractive index of the corpuscles is so well maintained that they are very easily counted.

In practice the author prefers to eject one or two drops from the tube of the hematocytometer, and thereafter to empty the remainder into a small glass tube which is closed by a well-fitting stopper. By this means the mixed blood and fluid may be sent long distances for examination. Messrs. Thomson, Skinner & Hamilton, of Glasgow, now supply such tubes at a nominal cost. The hematocytometer tube, after using this solution, is very readily cleaned, a circumstance which will commend itself to many. The rubber tube supplied with the Thoma-Zeiss hematocytometer is too short. The author prefers using a rubber tube of twice the length. He has also found a rubber ear syringe (one in which the ball and nozzle are composed of black rubber) to be most useful for washing the glass tubes, since one can affix the compressed ball to the tube and allow it to suck up water or alcohol for cleaning, and thereafter by compressing it the fluid is entirely discharged.

TRANSFUSION IN SEVERE ANEMIA.

Transfusion of blood in the treatment of severe anemia appears to be almost entirely given up, although some fifteen or twenty years ago it was freely made use of. Many older authorities have attempted to support the method, but the majority of the modern writers raise a number of objections to it. One must realize at once that transfusion is quite incapable of doing good in cases of tumor or of aplasia of the medulla bones, and in those processes in which there is a rapid and progressive destruction of red corpuscles. P. Morawitz (*Münchener med. Wochenschrift,* April 16, 1907) says that, apart from these cases, there is a long series in which the anemia depends, in part at all events, on the deficient regenerative power of the bone-marrow, but in which this power can be induced to recover itself. Systemic treatment by arsenic produces improvement and cure in this way. The objections to transfusion include the fear of ferment intoxication. The appearance of dyspneic attacks, edema, and fever were supposed to depend on an intoxication with fibrin ferment and a secondary capillary thrombosis. This, however, has proved to be erroneous, and it is now certain that intravascular thrombosis can only be produced by defibrinated blood when the blood is injected too fresh or too warm, or when the fibrin coagulum has been squeezed. It is impossible to prophesy when transfusion will be tolerated without reaction, or when rigors, hemoglobinuria, etc., will follow; but while these symptoms are sufficient to prevent the method from becoming popular, the author insists that no case of death has yet been recorded, and that it is just the cases in which the symptoms were well marked that the greatest good has been done. It must further be remembered that the cases for which transfusion may be required are cases for which one can do nothing in any other way. In France the transfusion method has been entirely replaced by treatment with hemolytic serum and organic extracts. These methods, however, are too new to justify one in giving up the old procedure, provided that the old method is capable of doing what is required of it.

In order to illustrate what transfusion is capable of doing, the author recites six cases in which he has carried it out. The method adopted was as follows: A healthy person, or one who had only some insignificant ailment, was chosen to give up the necessary amount of blood. The blood was obtained by puncturing the median vein after constricting the arm, and allowing the blood to flow directly into a sterile

glass bottle with a ground-glass stopper. The defibrination was carried out by shaking the bottle, which contained glass beads, for at least five to ten minutes after the blood had been drawn off. After standing for from twenty to thirty minutes the blood was filtered through several layers of sterile canvas into a second glass bottle, but the clot was not pressed. (If one withdraws about 250 cubic centimeters of blood, one will have about 200 cubic centimeters after it is defibrinated and filtered.) A cannula was then introduced into the median vein of the anemic patient by means of a small incision, and when the patient's blood had filled the cannula, a funnel with tube was attached to the same and the warmed blood poured into the funnel. The blood should not be allowed to flow quickly into the patient's vein, and the author found that if one allowed from twenty to thirty minutes for the whole 200 cubic centimeters one would not meet with difficulty. The cannula was then removed and the wound closed and covered. In the first case the patient was suffering from very severe anemia, and the characteristics in the blood count were like those of leukemia. Edema, ascites, and enlargement of the liver, loss of appetite, vomiting, and increasing illness persisted, in spite of arsenic and other forms of treatment. The transfusion was then carried out, and resulted in a steady recovery, the leucocytes regaining their original normal condition.

The second case was one of postpartum pernicious anemia. The symptoms here were extremely severe also, and were progressive; 150 cubic centimeters of defibrinated blood were transfused, and no reaction followed. From this time onward the patient made a good recovery.

The third case was another of pernicious anemia. Here, again, after other means had failed to check the progress of the disease, transfusion was carried out, and from that time improvement set in and continued until recovery was complete. The fourth and fifth cases were similar. A reaction was seen in the third and fifth cases. The recovery of the fourth and fifth cases could not be followed out completely.

In the sixth case the patient was suffering from a severe aplastic anemia. Here the transfusion, which was twice performed, failed to do any good, and death followed as the patient became more and more anemic. The post-mortem examination revealed atrophy or aplasia of the medulla of the bones. In this case no reaction followed the transfusion. The beneficial action of the transfusion was best marked in the first three cases, but in none did it set in immediately after the transfusion. A few days elapsed before the blood showed a disposition to improve. The immediate results in the fourth and fifth cases were somewhat alarming, but the untoward symptoms passed off safely.

The author discusses the possible action of transfusion from a theoretical standpoint, and concludes by stating that the method should be again revived for the treatment of severe forms of anemia.—*British Medical Journal*, July 20, 1907.

CAN ANTITOXIN, GIVEN BEFORE INFECTION AS A PROPHYLACTIC, PREVENT POSTDIPHTHERIC PARALYSIS?

ROSENAU and ANDERSON in Bulletin No. 38 of the U. S. Hygienic Laboratory answer this question as follows:

Postdiphtheric paralysis in the guinea-pig is an almost exact counterpart of the same sequel in man. We are therefore able to bring forward experimental evidence showing the effect of antitoxin upon postdiphtheric paralysis.

In the guinea-pig antitoxin cannot influence the diphtheric paralysis after the paralysis has appeared.

Antitoxin has no influence in preventing postdiphtheric paralysis if injected shortly before the paralysis develops.

Antitoxin given twenty-four hours after the infection can save the life of the guinea-pig and greatly modify the paralysis.

Antitoxin given in a single large dose

forty-eight hours after the infection did not modify the paralysis or save life. Thus, in their experiments 4000 units failed to modify the paralysis or save the life of guinea-pigs weighing about half a pound. Weight for weight this corresponds to 400,000 units for a 50-pound child.

Antitoxin given in repeated injections, beginning twenty-four or forty-eight hours following infection, seems to have a more favorable effect upon the subsequent paralysis than a single injection.

A very small quantity (1 unit) of antitoxin given twenty-four hours before or at the time of infection in their experiments prevented the development of paralysis.

In man more favorable results would be expected from the use of antitoxin than their work upon the guinea-pig indicates, for they were dealing with an early and malignant form of experimental postdiphtheric paralysis. This grave variety is, fortunately, rare in man. Further, they injected the entire charge of the poison directly into the tissues of the guinea-pig, while in man the toxin is doubtless elaborated more slowly. It may therefore be assumed that antitoxic serum, given at a somewhat later period than in their work upon guinea-pigs, would exert beneficial effects.

The fact that one unit of antitoxin prevents paralysis and saves life when administered timely, whereas 4000 units totally fails when delayed forty-eight hours, emphasizes the importance of using this sovereign remedy early.

THE TREATMENT OF DIABETES MELLITUS.

The *Practitioner* for July, 1907, contains an article on this topic by PARSONS. He concludes that:

1. There is no specific treatment for diabetes.

2. Drugs play at best only a subsidiary part in diabetic therapeutics.

3. Opium is the best antiglycosuric drug at present available. It may be administered in any stage of diabetes, but is most useful in severe cases, in which a rigid diet fails to remove all sugar from the urine. Dose, 1 to 5 grains of the extract.

4. Sodium salicylate and aspirin are valuable in mild cases of diabetes, and may temporarily completely remove glycosurin. Dose, 15 grains three times a day.

5. Jambul may be used as an alternative to sodium salicylate or aspirin.

6. A positive ferric chloride reaction indicates the daily administration of bicarbonate of soda in doses of 150 grains and upwards.

7. The intravenous injection of 35 ounces of a three- to four-per-cent solution of carbonate of soda affords the best chance of restoring consciousness in diabetic coma.

8. Constipation should be guarded against in all stages of diabetes.

SUDDEN CEREBRAL LESIONS: THEIR DIAGNOSIS AND TREATMENT.

GOWERS in the *British Medical Journal* of July 6, 1907, while not feeling very hopeful of therapeutic results in these states, thinks that in the immediate treatment some measures may be adopted in each lesion. A gouty state is common, and generally presumable, because age-imperfection of the organs generally leads to an approximate condition, and justifies some lithia or potash, combined with a diuretic, nitrous ether and spirits of juniper, to which some digitalis may be added —more if thrombosis is suspected than if hemorrhage is probable. The opposite rule should obtain with an aperient. If a clot has formed, only gentle action of the bowels should be secured; if a vessel has ruptured, an active purge is wise, such as croton oil, to lower the blood-pressure. Salines, it should be remembered, seldom alone act well in the horizontal posture; they need the aid of gravitation. Blood should be drawn to the extremities.

If there is reason to regard the lesion as thrombosis, little more can be wisely done. We have no practical agent to reduce the coagulability of the blood. Cit-

ric acid is said to have this effect, and may be given as lemon juice in plenty of water. When hemorrhage may be confidently diagnosed, the treatment should be such as to increase the tendency of the blood to clot. Salts of calcium have this effect, and may be given in whatever form can be most promptly obtained. If the lactate or chloride is not at hand, common chalk may be converted to a soluble salt by any suitable acid that is available. Arsenic, by hypodermic injection, has a similar effect, and one-fifth grain of the arsenate of sodium may be given in a few drops of water. There is no reason to believe that small doses of iodide of potassium, which are constantly given at the early or later stage, exert the slightest influence.

But one measure is imperative in every case of either kind—physical tranquillity. It should surely be superfluous even to mention this, but experience shows, too often, that it still needs to be insisted on. Even in the slightest case, if the patient must be moved, it should be as little as possible, and he should be absolutely passive.

HEART DISEASE IN RELATION TO PREGNANCY AND LABOR.

In the course of an article on this subject in the *British Medical Journal* of May 25, 1907, BLACKER asks the question, What is the best treatment of these cases? Hicks and French maintain that the treatment of a case of pregnancy complicated by heart disease is to treat the heart disease, and that we need take no account of the pregnancy. And that conclusion being in large part a correct one, the author does not consider in detail the treatment of the heart disease, but discusses the obstetrical treatment, and mainly the question whether it is desirable to carry out any treatment of the pregnancy besides that directed to the condition of the heart.

If we have a patient suffering from heart disease complicating pregnancy, we will place the patient at rest in bed, treating the heart condition by such rest or by the administration of heart or general tonics. Above all things, we will insist upon absolute rest in bed in the worst cases. Is it, however, ever advisable or justifiable to treat these cases by the induction of abortion or by the induction of premature labor? Is the contention of Hicks and French wholly correct that we need treat the heart, and the heart only, or is it necessary sometimes to cut short the pregnancy? The author believes it is, and that in many cases the correct treatment is not only to treat the cardiac symptoms, but to relieve the patient of the strain produced on the heart by the pregnancy by the induction of abortion in some cases, or by the induction of premature labor in others. And he is of opinion that there are more cases in which the induction of abortion or of premature labor is good treatment than is generally supposed. It may be said that the immediate danger is increased by the induction of abortion or of premature labor, because the danger after delivery is greater than that during pregnancy and labor. Therefore we may from time to time, as in other severe diseases complicating pregnancy, such as albuminuria, meet with cases in which the result of inducing premature labor is markedly to increase the danger to the patient for the time being. But in the majority of cases, if such interference is really necessary, we will by its adoption improve the patient's condition, and not make it worse.

The following is a good illustration of the class of cases in which abortion should be induced: The patient, a woman aged thirty-two, had had two children and three miscarriages. She was suffering from double mitral disease, with marked dyspnea, edema of the lungs, cough, and hemoptysis, and was markedly anemic. Considerable improvement took place with complete rest in bed and medical treatment, but the cough continued to be very troublesome. The edema of the lungs did not clear up entirely, and after a time her general condition remained stationary. As she did not continue to improve, and as she was five months pregnant, so that she had

a prospect of another four months before her confinement could be expected, in which the strain on the heart would continue to increase, the author decided to induce abortion by the rapid method under anesthesia. The cervix was accordingly dilated under ether to No. 26 Hegar's dilator, and then to a diameter of three and one-fifth inches by Bossi's dilator, and the uterus emptied. A considerable degree of hydramnios was present. After delivery the symptoms rapidly improved, the cough ceased, the physical signs of congestion and edema of the lungs disappeared, and the general condition improved very markedly. In such a case as this the induction of abortion is justifiable and occasionally necessary. The author here recapitulates the reasons why in this case he induced abortion: first, because the patient had marked symptoms of failure of compensation as early as the fifth month, and secondly, that these symptoms, although they were improved by rest in bed and medicine, did not entirely disappear. He thought further that the strain of another four months of pregnancy, increasing, as inevitably it must, during the latter part of the term, would be too much for the weakened heart, and that therefore it was justifiable to terminate the pregnancy.

If we decide to induce abortion in one of these cases, then the best method is to give an anesthetic, to dilate the cervix, and to empty the uterus at one sitting. The class of case, then, in which abortion should be induced, is that in which ordinary medical treatment has produced no, or only very little, improvement in the general symptoms, and in which no further improvement in the cardiac condition is likely, so that it is essential that the strain of a long pregnancy should be avoided if possible.

The following case is an illustration of the class in which premature labor may be induced: The patient was twenty-five years of age, a primipara with double aortic disease. She had some edema of the legs, was markedly anemic, and had severe syncopal attacks from time to time. With treatment by rest in bed and medicine she improved considerably, but when she got out of bed and about she had further syncopal attacks, so that her condition was not quite satisfactory. He tided her over her difficulties as long as possible, but at the thirty-eighth week the author determined to induce labor because the syncopal attacks were rather frequent, and it was therefore thought best to put an end to the pregnancy. A Champetier de Ribes's bag was introduced under an anesthetic, and when the first stage was completed the patient was delivered under ether with forceps. The child is alive, the mother did well, and at the time his article was written had lost all her cardiac symptoms.

Some authors hold that the induction of premature labor increases the danger to the patient; but the writer does not think that this is so, because if we induce premature labor we can make arrangements to carry out the delivery in the best conditions and with the advantage of skilled assistance. He thinks, then, that in the case of patients who do not improve under ordinary medical treatment, it is wiser to terminate the pregnancy rather than to let the patient go on to full term. This does not agree with the conclusions of Hicks and French, based upon the obstetrical histories of their 300 cases. They contend that the induction of premature labor is not necessary, since the great majority of their patients bore a considerable number of children with little or no danger. No doubt this is true of the general run of cases, just as it is true that the majority of cases of valvular heart disease complicated by pregnancy do very well with ordinary medical treatment. But we will meet with exceptional cases from time to time which require not only medical treatment, but, in order to lessen the strain thrown upon the overburdened heart, require further than this the induction of abortion or of premature labor.

The treatment of the condition at the time of the patient's confinement is of some importance. We must guard against the risk of cardiac failure, and if there are

signs after the delivery of the child that the right side of the heart is overdilated, we should encourage postpartum hemorrhage, or we should actually bleed the patient. Such a mode of treatment undoubtedly yields good results where there are symptoms of overdistention of the right side of the heart and consequently danger of paralysis. Where the patient is pallid and the pulse very small, with no signs of overdistention on the right side, and where it is probable, therefore, that the blood is accumulating in the abdominal veins, the intra-abdominal pressure should be maintained at the time of delivery by the use of a sand-bag or a tight binder, and appropriate means must be taken to stimulate the heart's action.

There remains for consideration only one question, and that is the truth of the dictum laid down in many books that a patient with heart disease should not marry, or if she does marry she should not have children, or if she does have children she should not suckle them. Such a dictum, it will be agreed, is too sweeping. The majority of women with heart disease pass through their pregnancy and confinement with perfect safety and have no symptoms, and therefore it is not right to say that a young woman who has heart disease should never marry. If her heart disease is compensated, and there are no symptoms, she may marry. Cardiac failure probably will occur sooner or later, as Hicks and French point out, whether she becomes pregnant or not. The bad effect produced on the heart by pregnancy is, on the whole, not sufficiently marked to justify us in advising a patient strongly that she should not marry. It is true that if she marries it will be better for her not to have children, and it is true that if she does have a child she should not suckle, but it is not right that a woman with heart disease should be forbidden to marry. Although the danger is undoubted, and the mortality is as high as 12 per cent, yet it has been exaggerated, and the majority of these patients do perfectly well, and run no very great extra risk. So that a young girl with heart disease which is compensated, and which is not complicated by any accompanying disease of the lungs or other viscera, may be permitted to marry. Her heart will probably fail sooner or later, whether she marries or not, but whether the time of the onset of such failure of the heart will be precipitated by child-bearing is a matter which admits of argument. There probably will be some precipitation, but it is doubtful whether the risk of this is so marked as to justify us in denying her the right to marry.

ATOXYL.

LAFAY (*La Clinic*, May, 1907) calls attention to the great therapeutic value of atoxyl. It is not a new product, having been obtained in 1863 by heating an aniline arseniate, and contains 29 per cent of arsenic. It is largely used for cutaneous affections, for acne, lichen rubra, psoriasis; it gives excellent results in acne vulgaris, and cures psoriasis completely. In chronic eczema, alopecia, and urticaria the results have been negative. Siegel obtained good results with atoxyl in anemic and chlorotic women, and claims that benefit results from its use in cases of valvular disease and myocarditis. In neurasthenia, hysteria, and chorea it is valuable, and Basedow reports surprising results in a case of epilepsy for which he employed it. Its use is particularly indicated in tuberculosis, and tuberculous glands and scrofulous affections generally. Moller got results which deserve to be better known when he gave it in intravenous injections in a case of pulmonary phthisis; and the author reports a series of cases of phthisis which have benefited so much from its use that he is inclined to consider it in some sort a specific for tuberculosis. It may be given by the mouth, subcutaneously, or intravenously. When given internally atoxyl is not well tolerated by the stomach. Rhoden overcomes this difficulty by giving it in the form of a pill with ichthyo-salicyl. In the treatment of tuberculosis two pills are given daily, after two days three pills, and

after a week the dose is increased by one pill daily until six are taken. For subcutaneous injections a 5- or 10-per-cent solution of atoxyl is used, and an injection given every five days, beginning with 0.2 cg. and increasing the dose up to 0.8 cg. When the maximum dose has been taken for some weeks it should be gradually reduced. For the intravenous injection a 20-per-cent solution is used in doses of 0.2 gr. every second day for three or four weeks.

Atoxyl is considered less toxic than other preparations of arsenic; it should be watched with some care at first, since the degree of toxicity is not absolutely decided. Fourneaux has thrown some doubt upon the widely curative powers claimed for atoxyl; it is, however, an active and useful drug, and merits trial.—*British Medical Journal,* July 13, 1907.

CONSTIPATION IN INFANCY AND CHILDHOOD.

The *Clinical Journal* of June 19, 1907, has in it an article by CAUTLEY in which he gives the following advice:

First of all relieve the retention of feces, and secondly try and cure the habit. Treatment must be steady and persistent. In the simplest cases, in breast-fed infants, all that is necessary is attention to the diet and habits of life of the mother. The breast feeding must be properly regulated. The quantity of milk can be increased by a liberal supply of fluid, tonics, etc. The percentage of fat in the mother's milk can be increased by giving a liberal diet with an excess of proteid, by a moderate allowance of alcohol, and by prolonging the intervals between each feeding. Liberal diet must be combined with plenty of exercise, otherwise the percentage of proteid in the milk is also increased. Sometimes the administration of a teaspoonful of cream in warm water twice a day, before feeding, is a sufficient remedy. For a bottle-fed infant a suitable milk mixture, containing a high proportion of fat and sugar, must be given. Water should be given freely between meals, and after a few months of age malted food or oatmeal may be added.

The habit of evacuation at the same hour daily must be taught to infants. At first it may be necessary to stimulate the action of the bowels by the introduction of the oiled tip of the finger, the nozzle of a syringe, or a soap suppository into the rectum. If these simple measures are insufficient, the following drugs may be used: manna, added once or twice a day to the bottle; sodium phosphate or citrate, gr. v. to x, or sulphur gr. j, added to each bottle, or fluid magnesia. If the stools are chalky and white, one or two minims of the tincture of podophyllin may be given two or three times a day. Peristalsis can be encouraged by abdominal massage along the colon, in a circle round the umbilicus, for five or ten minutes three times a day. The skin should be rubbed with oil to prevent excoriation. During the first year the palm of a warm hand should be used. After that age the finger-tips may be applied along the course of the large intestine, from the cecum to the sigmoid flexure, and no oil need be used. Soap suppositories are comparatively harmless, and consist of one grain of soap to five minims of oil of theobroma. They should be well oiled before insertion, and used night and morning. Small glycerin suppositories, gluten suppositories, or a simple cone of oiled paper are of similar value. If immediate relief is needed, from one-half to one drachm of glycerin in half an ounce of water should be injected into the rectum; it acts quickly and efficiently. Enemata of one-half to one ounce of cold water, soap and water, salt solution, or olive oil are useful. After the age of two years, medicated suppositories, consisting of 1/24 to 1/12 of a grain each of aloin, extract of belladonna, and extract of nux vomica, may be used night and morning. The continued use of suppositories or injections, whether of soap or glycerin, is not advisable, for it may set up catarrh of the rectum.

Internal medication is often necessary, but should only be used for chronic and severe cases. Manna, aloes, and sulphate

of soda may be given until two liquid stools are passed daily. This mixture should be given for two or three weeks and reduced slowly. At six months of age three to five minims of tincture of aloes, or the tincture of aloes and myrrh, may be given three or four times a day, combined with one minim of tincture of belladonna and fifteen minims of syrup of ginger. Tincture of nux vomica should be added if peristalsis is defective. To this mixture may be added ten grains of sodium sulphate or phosphate, or some syrup of senna. The syrup of senna, rhubarb, and figs are also useful. Drastic purges should be avoided. The usual dose of castor oil merely empties the bowel temporarily and is followed by recurrence of the constipation. For hard fecal masses an injection of warm olive oil, from one drachm to half an ounce, should be given, and followed in six hours by an enema of one to six ounces of soap and water, or salt solution. Older infants, say at two years, may have an injection of turpentine oil one drachm, olive oil two drachms, and the yolk of one egg, well mixed and added, with constant stirring, to four ounces of warm water. Injections must be given gently and slowly, and stopped at once if pain is produced. Mechanical aids, such as a bent hairpin, a scoop, or a teaspoon, must only be used by a medical man.

NOTES ON THE TREATMENT OF APOPLEXY.

PALMER states in the *Clinical Journal* of June 19, 1907, that there is a most important warning, which must be expressed in terms of negation: Never let an apoplectic patient lie on his back. This is, perhaps, the most important indication of all, and one that is not yet sufficiently recognized. The supine position is one which will, in most cases, bring a case of apoplexy to a rapidly fatal conclusion. It is in this position that stertor is most marked, and stertor is always an indication of danger, for apnea follows in its wake. We have already cerebral asthenia, and we can do without this additional complication. We cannot always relieve the asthenia, but we can in most cases prevent the apnea and keep the case uncomplicated, and this will make all the difference between the life and death of the patient. The accession of apnea will destroy the only chance of life remaining.

Dr. Robert Bowles, one of the original discoverers of the Marshall Hall method of resuscitation, has for the last fifty years been making observations on stertor in this connection; on animal dissections, on the dead body, on the healthy living body, as well as in pathological conditions—especially apoplexy and allied states—in cases of drowning and of artificial anesthesia. In season and out of season he has constantly insisted on the importance of this symptom in apoplexy, and the author thinks that any one who has read his work on the subject will be convinced of the correctness of his conclusions. He admits that when he first saw the account of these observations, about thirty-five years ago, he was not enthusiastic about them. He looked upon apoplexy as a fatal disease, and it did not appear to him to be a matter of any very great importance whether an unconscious patient lasted four days or only three. But he has seen recoveries since then, more or less complete, and is convinced that the exclusion of apnea and the encouragement of blood aeration by preventing stertor are important factors in the result. It would be impossible here to go through the various experiments and demonstrations; they are set forth in the work referred to. The general principle is obvious. Stertor means, of course, some obstruction to the entry of air into the lungs. In hemiplegia we get paralysis, on one side, of the muscles of the palate. When the patient is on his back the paralyzed muscles allow the tongue to fall back and diminish the opening into the larynx. Stertor ensues, aeration in the lungs is obstructed, the supply of pure arterial blood to the brain, now more than ever necessary for the restoration of its functions, is prevented, the backward pressure causes still further distention of the

cerebral veins and sinuses, cerebral auto-intoxication takes place, and the patient dies.

If the patient is now placed on the sound side, there is often little or no improvement. The paralyzed muscles fall down from the affected side and diminish the size of the opening as before, though perhaps to a less extent, and the stertor continues. The patient must therefore be placed on the paralyzed side; then the paralyzed muscles on this side will fall downward by gravitation, while on the sound side they will be held up by muscular action, and the largest amount of air possible will be able to enter the lungs. Stertor will cease; air will enter the lungs more freely; aërated blood will be conveyed to the cerebral arteries; while the cerebral veins and sinuses will be relieved of their distention.

In carrying out this treatment there is, of course, a very serious danger to be guarded against. If the patient lies long on the paralyzed side he will almost certainly have a bed-sore over the hip-joint. The position must therefore be changed at frequent intervals, by placing him for a time on the sound side; not on the back, if it can possibly be avoided. The tongue falling back toward the vertebral column causes far more serious obstruction than the palatine muscles, or the tongue even, falling to one side. In other words, pharyngeal stertor is more obstructive than palatine. Still, even a bed-sore, if it cannot be avoided, is a less evil than suffocation. In these people bed-sores form on the paralyzed skin with extraordinary rapidity. The author had it occur in one case, after which it healed up, and the patient recovered.

THE USE OF PILOCARPINE FOR THE RELIEF OF PRURITUS.

In the *Medical Record* of May 25, 1907, REID states that it does not seem to be generally recognized that pilocarpine has a specific effect in different forms of pruritus. Dr. Holstern used it in pruritus coincident with jaundice, and with happy effect. Since that time the writer has used it in pruritus vulvæ, pruritus associated with skin disease, and general pruritus without any assignable cause.

Pruritus seems to be a neurosis in some way allied to neuralgia, and has this in common with neuralgia, that it is periodic and may occur without any immediate cause. In pruritus vulvæ the writer has found the same benefit from pilocarpine in cases occurring with and without diabetes. The ordinary dose is one-quarter grain, to be given only when the itching manifests itself, and is not to be repeated unless the itching returns. It is well to begin with one-eighth grain, inasmuch as some patients are very susceptible to the drug.

It may be of interest to note a case of pruritus occurring in a medical student at the time of his final examinations. Without the use of pilocarpine he would have found it impossible either to think or write. In this case 1/120 grain of atropine in conjunction with the pilocarpine prevented the sweating. In all of the cases referred to pilocarpine was given by the mouth.

PRIMARY LIGATION OF THE VAS DEFERENS BEFORE REMOVING THE TESTICLE.

WALKER (*Boston Medical and Surgical Journal*, March 28, 1907) states that a recent study of genito-urinary tuberculosis has convinced him that during the excision of the tuberculous testicle the handling of this organ is likely to force tubercle bacilli into the abdominal portion of the vas or drive the organisms into the blood or lymph vessels and thus produce a general infection. In order to eliminate this danger an incision should first be made high in the groin and the spermatic cord ligated. After this the incision should be enlarged and the testicle brought up; the cord can then be cut below the primary ligature, and afterward such remaining part of the cord as desired cut off. The same procedure should be carried out in operating for malignant growths of the testicle.

SUCCESSFUL REDUCTION OF DISLOCATION OF THE CERVICAL VERTEBRA.

SHERMAN (*Boston Medical and Surgical Journal*, April 25, 1907) reports two cases of successful reduction of dislocation of the neck. The first case was that of a woman who had lifted a kettle of water from the stove with the left hand, at the same time turning her head quickly to the left. Her head remained in this position and was inclined somewhat to the right. Under chloroform anesthesia the head was tilted backward diagonally to the left and then rotated to the right. There was a distinct click as the reduction took place. On recovery from the anesthetic the patient was able to turn her head slowly in every direction. No apparatus was applied, but the patient was kept in bed with caution as to movements.

The second patient had a history somewhat like the first, as she was carrying a heavy weight when the accident occurred. The face was turned and tilted somewhat to the right. When relaxed under chloroform the head was tilted diagonally backward and to the right and then rotated to the left. No click was heard, but the head was then freely movable in all directions. The neck was painful and tender for a few weeks, but recovery was complete.

The author quotes Walton's description of the mechanism of dislocation of the neck and his suggestion as to reduction.

PUS TUBES IN THE MALE.

BELFIELD (*Medical Record*, May 4, 1907) states that the infections of the seminal tubes are three—the gonococcus, pyogenic bacteria, and the tubercle bacillus. As the last induces suppuration only with the aid of the pyogenic bacteria, it will be omitted from consideration as a cause of pus tubes in the male. The pus infections of the seminal tube are extensions from the deep urethra; they result from (1) gonorrhea, (2) stricture, (3) prostatic concretions, and other causes of prostatic suppuration in middle-aged and elderly men.

Invasion of the seminal vesicle by the gonococcus induces the symptom-complex usually considered indicative of prostatic abscess—frequent and painful urination; complete retention of urine, terminated by a sudden discharge of pus, often an ounce or two, into the urethra. These phenomena are usually due to abscess formation in the seminal vesicles, as emphasized by Lloyd fifteen years ago; or in the utricle, as shown by Belfield twelve years ago.

A typical gonorrheal abscess of the utricle was recently observed by Drs. L. E. Schmidt and Belfield; the symptoms were those usually ascribed to prostatic abscess, but the fluctuating swelling was greatest midway between the lateral borders. With the finger-nail the abscess was incised from the rectum; after the escape of perhaps an ounce of pus, the lateral lobes and median groove were distinctly felt.

Stricture of the bulbous urethra favors pus infection, which, beginning in the poorly nourished tissues, extends backward through the deep urethra into the seminal duct and vesicle, at times even to the epididymis. As the infection may extend forward in the urethra also, and thus produce a pus discharge from the meatus, the entire clinical picture simulates a gonorrhea, and by physicians who neglect to examine the pus with the microscope it is often so called—to the disgust and indignation of the innocent patient.

The non-gonorrheal infections of the seminal tube in men over forty years of age are, like everything else causing bladder symptoms in these patients, labeled "prostatic hypertrophy;" and they do indeed cause the same symptoms, including even complete retention of urine. These are the cases of alleged prostatic enlargement that were benefited by vasectomy, when that operation was popular. The prevalent rage for prostatectomy causes the unfortunate subject of vesiculitis to be accused of harboring an enlarged prostate and to be condemned to prostatectomy. A typical example of this common ailment of

elderly men was a patient seventy-two years old, seen with Dr. Henrotin nearly three years ago. He suffered from the usual symptoms of "cystitis" for several weeks, culminating in complete retention of urine. The left seminal vesicle was distended and tender, the prostate merely swollen; incision of the abscess was declined, but the pus traversed the vas, causing an abscess of the epididymis. When this was opened and the vesicle thereby drained, the bladder function was completely restored and the patient has had no urinary trouble since. A case practically the duplicate of this was seen with Drs. Billings and Phillips about the same time. By all the canons of the general surgeon, both these old men should have been subjected to prostatectomy, though their prostates were in no wise to blame, unless indeed because of the irritating presence of prostatic concretions, universally found in men past middle age.

The pus infections (non-gonorrheal) of the seminal tube, especially in elderly men, constitute an almost wholly neglected field; the obvious explanation is that already indicated, namely, the practical identity of symptoms with those caused by infections of the prostate and bladder, from which pus tubes have not been clinically distinguished. One whose attention has never been directed to this topic will be surprised to discover the number of cases treated for cystitis, prostatitis, and "prostatic enlargement" whose lesions are really pus infections of the seminal tube and vesicle. The differential diagnosis is by no means difficult; the usual mistake in diagnosis arises from the habitual failure to recognize pus tubes as the cause of pyuria, frequent and painful urination, and partial or complete retention of urine.

Gonorrheal infection of the seminal vesicle, on the other hand, has been frequently identified since Lloyd called attention to its occurrence and advised incision of the suppurating vesicle with a long-bladed knife through the perineum. About the same time Dittel, the father of perineal prostatectomy, used the incision which he had devised to attack the prostate for exposing and incising gonorrheal abscesses of the seminal vesicle. Dittel's operation was later modified and developed by Fuller, who has reported seventy-four cases in which he has attacked the vesicle for suppuration and other lesions through this extensive perineal dissection.

The Dittel-Fuller operation is admittedly severe and bloody, entailing risks and requiring weeks of confinement to hospital. It seems justified, if at all, only in cases of perivesiculitis, since the immediate relief sometimes demanded by pyovesiculitis is furnished far more simply and safely by incision with a cautery knife from the rectum. (The cautery is preferable to the knife for this incision, because it avoids bleeding, averts infection, and prevents premature closure of the wound.) But a much simpler and more effectual medication of the seminal tube and vesicle is secured by the operation that Belfield has devised and practiced, which can be done in the office. It consists essentially in opening the vas, stitching the cut edges to the skin, and injecting through a curved hypodermic needle any chosen solution into the proximal end; this liquid traverses the vas and ampulla and enters the seminal vesicle. By digital massage from the rectum the injected liquid can be expressed into the urethra if desired. Through the fistula daily injections of the vesicle can be made so long as seems necessary, after which the fistula is easily closed. Complete transverse section of the vas may safely be made, if preferred, since anastomosis of the cut ends and restoration of the lumen is easily accomplished. For injections through the vas the solutions commonly employed in the urethra are used; but the first injections should not exceed thirty to sixty minims, lest spermatic colic and retention of urine be provoked. Both of these effects the writer witnessed in his earlier work; the spasmodic contraction of the vesicle seems to cause spasm of the bladder sphincter, an item of both clinical and physiological interest. The influence of the seminal ducts

upon the bladder and its sphincter suggests an explanation of the cause and cure of "irritability" of the bladder in some cases.

CANCER—TREATMENT WITH PANCREATIC EXTRACT.

It has been shown that the glycogenic process is disturbed in cancerous individuals, and ODIER (*Revue Médicale de la Suisse Romande,* No. 3) finds that whereas the blood of healthy persons loses in specific gravity if placed in the oven for two hours, this loss being due to loss in glycogen content from hemic ferments, the blood of cancerous persons has always a high specific gravity from the large amount of glycogen always present, and there is no loss in specific gravity when it is kept at body temperature, showing absence of the usual glycolytic ferment.

He attempts to remedy this defect in the chemistry of the organism by giving injections of pancreatic extract. Backer has attempted to reach the same end by administration of yeast. Odier finds that the injections have a very marked influence on all recent growths, on metastases and recurrences, but very little effect on old or large tumors. The pain is always markedly influenced, and two cases of inoperable cancer of the breast were able to give up morphine after two injections. The only recent tumors not favorably influenced are those occurring in women long after the menopause, when the sexual organs are degenerated. There is some connection between the glycolytic function of the pancreas and the genital function.

HEMORRHOIDS—TREATMENT BY INJECTION.

The objections which have been raised to the injection of strong solutions of carbolic acid in hemorrhoids are answered by VULLIET (*Revue Médicale de la Suisse Romande,* No. 3), who claims that the method is without danger and that the objections apply only to other forms of vascular tumors, goitres, etc.

The method is only applicable to recent or inflamed growths, and not to old, indurated, quiescent masses. If the anus is fully dilated and the mass of vessels brought out into plain view, it is easy to introduce the needle so that the point reaches any part desired. The needle is introduced into each nucleus successively, and one or two drops of 80-per-cent carbolic acid slowly injected. The strong carbolic acid instantly coagulates the blood and tissues in the part, and thus prevents the absorption of the liquid, or its escape into the circulation. Any size mass may be treated, even those as large as an adult fist. The pain is slight.

FRACTURE OF THE LOWER END OF THE HUMERUS—OPERATION.

When the fracture is without displacement one may employ massage and passive motion from the first, the patient wearing simply a bandage for protection. Immobilization in extension is indispensable if there is lateral deviation, internal or external. These words of Rieffel are quoted by HUCHET (*Presse Médicale,* No. 24) at the beginning of his article.

Immobilization is to be condemned, as "motion is necessary to the life of the tissues." If the fracture cannot be reduced or cannot be held without splints, if the joint surface is involved, or if a nerve is injured, it is best to operate, and fasten the ends of the fractured parts. Otherwise a stiff joint is almost inevitable. The best method is to expose the elbow as required, and after reducing the displacement to bore a fine hole through the fragment and into the shaft of the bone. This drilled canal serves to guide a metal pin which is driven into the bone. Steel is to be preferred, and need not be removed unless a fistula forms. A single pin suffices to hold fractures of the condyles and epicondyles, while three are required for Y fractures. If the fracture is transverse and some distance above the joint it may be better to screw a silver plate on the bone. If there is trouble in the function of the ulnar nerve after such fractures, the nerve should be exposed and freed from adhe-

sions or pressure, etc. The most important point, however, is to deepen the groove behind the inner condyle, in which the nerve is protected from traumatism.

COMPRESSES LEFT IN THE ABDOMEN—PREVENTION.

A novel suggestion is made by WECHSBERG (*Centralblatt für Gynäkologie,* No. 12), who claims that no method of counting or other means of accounting for compresses is certain to guard against error as long as men are human.

He attaches each compress or piece of gauze, used after the abdomen is opened, to the wire basket in which they are sterilized. Only large compresses of several layers of gauze are used, and to each compress is attached a piece of narrow tape, over six feet long. The free ends of the tapes are passed through the meshes of the wire basket and tied together. The basket may be placed on the floor under the table. The tapes are not annoying after one is used to them.

TREATMENT OF HEMOPHILIA WITH ANTITOXIN.

A boy of eleven years, descended from a hemophilic family, forms the basis of a communication on this subject by BROCA (*Presse Médicale,* No. 24).

The boy had a severe hemorrhage, following the loss of a milk-tooth. The alveolus was tamponed with a piece of gauze saturated with antidiphtheric serum, and 20 cubic centimeters was administered subcutaneously. The bleeding ceased promptly and did not recur.

ABDOMINAL SECTION—GRIDIRON INCISION.

The praises of the gridiron incision are loudly sung by BARACZ (*Centralblatt für Chirurgie,* No. 12), who prefers the modification of Weir, for most cases.

This is an incision several inches long, running from and at right angles to a line drawn from the anterior superior spine of the ilium to the umbilicus. It may extend slightly above this line, and run parallel to the fibers of the external oblique. This muscle is separated with a dull instrument, and the fascia below cut in a line parallel to it. The incision is continued into the sheath of the rectus muscle, which is pushed aside. The internal oblique and transversalis are split, as was the external oblique, parallel to their fibers, and the peritoneum incised as necessary. This gives a much better oversight of the parts than the original McBurney incision, and is also useful for hernias, incarcerated inside the neck of the sac, for all operations on the cecum, and especially for artificial anus, as the crossed fibers form a sort of sphincter.

BREAST AMPUTATION—AFTER-TREATMENT.

To avoid the stiffness of the shoulder, which prevents the arm from being raised, after amputation of the breast, EWALD (*Centralblatt für Chirurgie,* No. 14) recommends the following dressing:

After dressing the wound as usual, but with the arm free, the patient is put to bed and the hand of the affected side is folded around a short stick of wood, and held closed by a bandage. The hand is then attached to a support which extends out from the head of the bed, so that the arm is about horizontal, and the forearm bent up. The elbow is supported by a plaster strip around the support. The position exercises traction on the fold of the axilla and thus prevents the collecting of blood in the wound. The arm is left still for three days, and is then lowered for a few minutes at a time until it can be moved without danger of opening the wound. When the patient rises the arm is fixed across the body while she is up, and suspended as soon as she returns to bed. The dressing has not been found especially uncomfortable, and the arm can be raised to the head at any time after the dressing is removed.

PLACENTA PREVIA—TREATMENT IN PRIVATE PRACTICE.

Immediate delivery after the first hemorrhage is recommended by FUETH (*Centralblatt für Gynäkologie,* No. 12), as there is great danger of secondary hemorrhage or septic infection with other methods of treatment, unless the patient can be watched continuously until delivery.

The liability to placenta previa bears no relation to the age of the mother nor to the number of previous conceptions. The first hemorrhage usually occurs some time before labor, and it is apt to recur if left to nature. Of the cases without immediate medical aid, one-third died. Of 726 cases only 23 had no hemorrhage before labor pains occurred. Treatment with tampons gives great danger of infection in private work, and also of repetition of the bleeding when no physician is at hand. It is therefore best to induce labor, preferably by introduction and inflation of a metreurynter, as soon as the diagnosis can be made. In hospital practice, where physicians are always at hand, it is perhaps safe to wait if the bleeding is not profuse or can be checked without difficulty.

CARCINOMA—UNEXPECTED RECOVERIES.

In several instances recovery has followed palliative operation performed for the temporary relief of inoperable cancers, and WEINDLER (*Centralblatt für Gynäkologie,* No. 22, 1907) reports three such cases which have occurred in his own practice. All were tumors of the cervix and uterus.

In the first case a vaginal total extirpation was contemplated, but abandoned on account of the extensive infiltration found at operation. Instead, the womb was deeply curetted, and the cavity burnt with the actual cautery. At long intervals the wound was cauterized with pure carbolic acid. The wound healed promptly, and there has been no return of the growth for five years. The other patients exhibited similar lesions, but the firm adhesions of the uterus showed operation to be hopeless. Both were treated by removing as much of the tumor as possible with the sharp curette, and burning the wound deeply with the actual cautery. This was followed by the carbolic acid treatment. These cases have remained free from recurrence for four years. Czerny has cured a case by a similar procedure, using tampons soaked in 30-per-cent zinc chloride solution instead of the carbolic acid. The recovery of these cases is not yet satisfactorily accounted for. Various explanations are offered by different pathologists, but the effect of the cauterization on the blood supply seems to be the most important factor.

THE TECHNIQUE OF PANCREATECTOMY.

DESJARDIN (*Revue de Chirurgie,* No. 5, 1907) notes that heretofore affections of the pancreas have been treated by indirect operation rather than by measures dealing immediately with the diseased organ, and that the results are palliative rather than curative. The author notes that only twice have surgeons attempted complete pancreatectomy—Billroth in 1894 and Franke in 1901, and both had an operative success. Billroth lost sight of his case; the one operated on by Franke died five months afterward of generalized cancer, but without presenting any symptoms that he perished because his pancreas was taken out. There are many reports of partial pancreatectomies, but usually these were incidental to other operations. Partial resections of the tail of the pancreas have given seven cures and three deaths; partial resection of the head, seven cures and nine deaths; total resections of the head, two deaths.

Desjardin notes that a complete pancreatectomy necessitates the removal of the duodenum because of the intimate adhesion between these two organs and the common vascular supply. He observes that in some cases the upper part of the ascending colon is opposed directly to the right border of the ascending portion of the duodenum without interposition of the serous

membrane. It must also be borne in mind that the mesenteric artery and vein as they emerge from the lower border of the pancreas pass in front of the duodenum, and finally the middle colic artery must be respected which lies immediately behind the pancreas, which may readily be wounded. This accident has happened in the hands of the best operators. Moreover, the portal vein and the vena cava are placed so closely posterior as to bring them within danger of trauma. To avoid the ascending colon Berg makes, two finger-breadths to the right of the second portion of the duodenum, an incision three or four centimeters long running down to the origin of the transverse mesocolon. The peritoneal flap with its base attached to the duodenum is stripped up by the finger, thus exposing the right border of this portion of the gut. If the duodenum be stripped well forward the portal vein and the vena cava are readily avoided. The stripping should be accomplished with the finger and is usually easy, since there is a natural plane of gravity. This stripping is regarded by Desjardin as the key of the operation, since it enables the surgeon to explore the lesion to bring the organ to the surface and to avoid wounding the important vital structures surrounding it. This blunt dissection must be practiced gently in the third portion of the duodenum lest the mesenteric artery and vein which pass in front of this portion of the gut should be torn. It is noted that the operation can be done in two stages, the gastro-jejunostomy preceding the pancreatectomy. If the operation is done at one sitting it is held that for the saving of time an anastomosis button should be employed.

As for the technique there is placed beneath the lumbar region a roll pillow as in biliary operations; a long incision is made from the costal border of the middle line downward to just above the umbilicus, and obliquely downward from this point to the left and below the umbilicus. The belly having been opened the omentum is pushed to the left, and an incision is made through the peritoneum dorsally 2 centimeters to the right of the descending portion of the duodenum and parallel with it. The peritoneum is stripped up toward the central line as far as possible until the portal vein and the vena cava have been passed. The pyloric gastroduodenal arteries are ligated, the right border of the omentum ligated and divided, and the pylorus is sectioned between two clamps. The duodenum thus freed is stripped downward, exposing the common duct, which is also divided between two clamps as low as possible if it is dilated, near the cystic duct if it is not dilated. As soon as the common duct is divided the duodenum is thoroughly freed except for the insertion of the mesocolon, which should be cautiously stripped a little for the purpose of disengaging that portion of the gut lying just beneath the mesocolon. In this blunt dissection the superior mesenteric vessels are encountered and the denuded jejunal angle is reached; the clamp is placed on the bowel at this point and it is divided. The duodenum is now held by the pancreas. On the body of this organ a clamp is placed obliquely, directed upward and to the right toward the pylorus in order to avoid injury of the colic artery. The gland is now sectioned, leaving in the wound a clamp on the pylorus, another on the common duct, another on the duodenum, and a fourth on the pancreas. All bleeding points are secured, and the stomach is closed by a double suture, after having placed through the pyloric opening and in proper position a Murphy button for an anastomosis with the jejunum. The sectioned end of this gut is then drawn up to the posterior wall of the stomach in order to make a terminal anastomosis, but on accomplishing this procedure two Boari buttons are placed in this portion of the gut. The jejunum is then implanted into the stomach by securing a Murphy button in its end and pressing the latter into the button already secured in the stomach wall. The common duct is then anastomosed with the jejunum by means of a Boari button, all bleeding points of the sectioned surface of the pancreas are sutured, the canal of Wirsung is freed, and it also is

anastomosed into the jejunum by means of a Boari button. This anastomosis is, of course, impossible unless the duct of Wirsung is dilated—indeed, the section may be carried so far back that two or three very minute ducts are all that can be found. Under such circumstances the cut section of the pancreas is inserted into the jejunum. This has experimentally been followed by disastrous results, but probably because the cut section projected into a portion of the intestine through which was passing the ordinary intestinal contents.

Desjardin proposes the following method for avoiding ascending infections: About 30 centimeters of the jejunum is drawn out and the bowel then divided between two clamps. The mesentery is then freed to such an extent as to permit without torsion complete mobility of the loop thus excluded. Into this mobilized loop is implanted the sectioned end of the pancreas, or at least that portion just above its ductus, and an anastomosis is made between it and the gall-bladder. One end of this loop is then implanted into the jejunum just below the insertion of the latter into the stomach. This excluded loop thus receiving the bile and pancreatic fluid is then joined to the jejunum just below its implantation into the stomach by lateral anastomosis.

CHLOROFORM SHOCK—LESSENING BY TRANSFUSION.

A long series of experiments made by BURKHARDT (*Archiv für klinische Chirurgie,* lxxxii, 4) led to the interesting discovery that although an infusion of salt solution given intraperitoneally, after chloroform narcosis, had no beneficial influence, a similar infusion given before narcosis lessened the time of recovery, shortened the period of albuminuria, and made over twice as much chloroform necessary to produce the death of the animal.

The experiments were performed on dogs, 250 to 300 cubic centimeters (8 to 10 ounces) being given intraperitoneally ten to twenty minutes before or five to ten minutes after the chloroform. Although the animals injected after the anesthesia excreted a very much greater amount of urine than those not treated, the excretion of the chloroform was not influenced. The dogs to which the injection was given before anesthesia passed a slightly increased amount of urine, but this contained much more chloroform. The excretion of the chloroform in the urine ceased several hours sooner than in the controls.

These results are explained by the fact that the principal element in the shock of chloroform is fall of the blood-pressure, and this is prevented by the use of salt solution before but not by its use after the anesthetic. In cats a mixture of air with 1 1/5 per cent chloroform causes a steady and progressive fall in the blood-pressure, which ends in the death of the animal. If a solution of salt is given immediately before narcosis, this concentration is insufficient to produce a marked fall. If an infusion is given in the course of a narcosis, it is followed by an immediate and marked rise in blood-pressure. For the last four months all patients operated on in chloroform narcosis have been given a hypodermoclysis of 1500 to 2000 cubic centimeters (1½ to 2 quarts) fifteen to thirty minutes before the operation. The fall of blood-pressure was very much lessened, the pulse good, the recovery from the anesthetic prompt, and after-phenomena—headache, vomiting, weakness, etc.—absent. There was no tendency to an increased amount of bleeding.

PRIMARY TYPHLITIS WITHOUT APPENDICITIS.

MCWILLIAMS (*Annals of Surgery,* June, 1907) in a consideration of this subject reaches the following conclusions:

Primary, acute, or chronic typhlitis occurs independently of appendicitis, dysentery, tuberculosis, actinomycosis, or cancer, and is idiopathic in origin or depends on coprostasis.

Primary typhlitis, the appendix being normal, may lead to perforation, with the

formation of perityphlitic abscess or general peritonitis.

The symptoms of primary typhlitis are usually identical with those of appendicitis, and the indications for operation are similar in the two conditions.

Primary typhlitis is rare in comparison with the frequency of appendicitis.

The differential diagnosis of inflammatory typhlitis from tuberculosis, cancer, and actinomycosis may be impossible at operation, in which case a section of the cecum should be removed for microscopical examination.

The recurrence of symptoms after removal of the appendix may be due to attacks of typhlitis, the treatment for which consists in the regulation of the diet and the use of oil enemata, etc.

The danger of a primary typhlitis consists in the liability to rupture of an ulcer and to the development of appendicitis.

Purgatives are contraindicated in inflammations of the right iliac fossa because of the danger of rupturing an ulcer in the cecum or appendix, or of breaking up the adhesions about an abscess.

The treatment of primary typhlitis consists in laparotomy, removal of the appendix, closure of any perforation if possible, invagination of any threatening perforation of the cecum, drainage of the right iliac fossa, and the removal of a piece of the cecal wall for microscopical examination, if that be necessary to establish the diagnosis.

AVULSION OF THE TUBEROSITY OF THE TIBIA.

If the foot is suddenly arrested during a powerful contraction of the quadriceps, any of three accidents may result. The most common of these is transverse fracture of the patella, the next is rupture of the tendon, and LINKENHELD (*Deutsche Zeitschrift für Chirurgie*, lxxxvii, 1) states that avulsion of the tuberosity of the tibia is extremely exceptional. When it does occur it is almost always unilateral, the case reported in this article being the only bilateral one, as far as could be determined. It occurs almost always in persons from fourteen to twenty years old, frequently during gymnastic exercises. The case reported occurred in a gymnast of sixteen years, whose heel caught as he made a difficult jump from a spring-board. The accident resulted from a violent effort to save himself. The symptoms were those usually seen—immediate inability to stand or to extend the leg and extreme pain below the kneecap, followed shortly by swelling of the soft parts and effusion of blood. There was no effusion into the knee, which is often noted. Examination showed on one side the fragment torn free and drawn upward, and on the other side only partly free and turned forward like a hinge from its upper edge. *X*-rays confirmed the diagnosis, which is usually easily made. Treatment was operative, and recovery complete and prompt.

Of 29 similar cases reported, 23 were treated without operation; of these 11 had a perfect result, 7 were permanently more or less lame; in 5 the result is not mentioned. The duration of treatment was from two to five months. In all 6 of the cases operated on the functional result was perfect and the treatment lasted only from three to eight weeks.

The operation consists in exposure of the injured point, cleansing of the wound, and reposition of the fragment. If it is only partly torn away it may be held in place during healing by sutures through the periosteum. If these are not sufficient, a nail is driven through the fragment into the bone. The choice of incision and technique lies with the surgeon.

The liability to the accident is dependent on the imperfect union between the tuberosity and the shaft of the bone during early life. It is not certain whether the fragment develops from its own nucleus, although this is probable, or whether it grows down like a protruded tongue from the articular cartilage, but in any case the mechanism of the fracture is much the same as that of separation of an epiphysis. Complete bony union of the tuberosity occurs normally between the twelfth and twenty-fifth years.

THE PROPER SHOES IN AID OF THE TREATMENT OF FLATFOOT OR WEAKENED FEET.

BERRY (*American Journal of the Medical Sciences,* May, 1907) notes that the weakened foot goes through a series of changes, beginning with a disability known as pronated foot and ending with the deformity of rigid flatfoot, and that the term flatfoot cannot be used to designate all the forms of this trouble, but should be restricted to one phase of the progressive weakened condition.

A brace he considers necessary at times and nearly always beneficial. In order that it should have its full benefit it should be used in conjunction with a proper shoe. Strength comes with a brace or shoe only as it is properly used. Physicians can supply the apparatus, but the patients must cure themselves, since when the foot is put in proper position its ultimate strength and self-dependence rests absolutely upon active exercise, gymnastics, etc., upon the part of the patient.

Berry observes that a shoe should have a low heel with little or no spring to the sole, thus allowing the toes to come to the ground. It should be broad enough across the ball of the foot to give full play to the weight-bearing portion. The shank should be to the outer side of the shoe (where the weight of the foot comes) instead of in the middle, as in the ordinary shoe. The front part of the shoe should have the same angle of adduction as is normal to that individual foot. Care should be taken, especially in weakened feet, to keep the heels of the shoes built up and not to become worn off on one side.

Berry's method of getting a proper shoe made is as follows: He obtains an imprint of the foot by thinly spreading on a sheet of plate glass, by means of an ink roller, one part of lampblack, one part of powdered acacia, and three parts of water. The patient steps on this with his whole weight, thus blackening his weight-bearing sole. He is then instructed to raise his foot, and after the glass has been replaced by a sheet of rough white paper, to bring the foot down upon the paper and rest his full weight upon it. A pencil tracing is then made around the foot. When the foot is placed upon the paper care should be taken that it is held parallel to the other foot, since in that position the feet have a normal amount of adduction. An inner sole patterned after the last is now marked out with the imprint and the tracing as a guide. The shoemaker takes measurements as follows: (1) Circumference of the foot over the big and the little toes; (2) the ball of the foot; (3) the waist; (4) the instep; (5) the heel and the top of the instep; and (6) the heel. The measurements are also taken of the ankle and the top of the shoe. These measurements and the inner sole patterns are sent to the last-maker, who has a model last in stock from which he makes for the patient a similar last, but having an inner sole pattern and measurements corresponding to the patient's foot. The last is returned to the shoemaker for any little changes necessary to make a better fitting shoe. Separate inner sole patterns, measurements, and lasts have to be made for both feet of the patients.

There is usually some difficulty about the patient becoming used to the new shape, but in a few days the discomfort wears away and the freedom of motion and comfort consequent upon the use of properly constructed shoes soon cause him to become an earnest advocate of their use.

THE SURGICAL TREATMENT OF SPLANCHNOPTOSIS.

DAVIS (*Annals of Surgery,* May, 1907) notes that tenderness over all parts of the abdomen is one of the almost invariable symptoms of splanchnoptosis associated with a greater or less degree of autotoxemia and many nervous manifestations. Two anatomical changes are present: the weakened muscular wall of the abdomen, the stretched and attenuated ligaments. To these must be added dilatation, to a greater or less degree, of the stomach and intestines, and increased weight of the solid

organs, liver, kidneys, and spleen, due to the long-continued passive congestion. The tendency is for the trouble to become progressively worse, for the abdominal muscles to become weaker and thinner, the suspensory ligaments longer and more attenuated, the dilatation and enlargement of the viscera more pronounced.

The author does not believe that any case of extreme splanchnoptosis is ever cured by medical or mechanical treatment. Davis advises correction of gastroptosis by suturing the small omentum near its attachment to the smaller stomach curvature to the abdominal wall, as high as possible. He believes this operation quite as good as the one of shortening the lesser omentum, and it is very much easier to do and seems less likely to interfere with the circulation. Moreover, in many of these cases a hepatopexy is needed at the same time, and it is as well not to have the extra weight of the stomach and colon pulling down on the liver.

Coffey's method of suspending the stomach in a hammock by fastening the omentum to the abdominal wall seems rational and especially applicable when the lesser omentum is so weak as not to be equal to the task of supporting the stomach. It is possible this method may develop a kinking at the pylorus.

Gastroplication, in cases of dilatation, seems of little value. If the dilatation is dependent on descensus, when the stomach is raised to its normal position it will very soon regain its natural size.

If, on the contrary, dilatation be due to obstruction, it will recur unless the obstruction be removed.

Gastroenterostomy has been strongly advocated and gives fairly satisfactory results, though it does not cure the condition. After any suspending operation, several weeks in bed with vigorous massage of the abdominal wall and forced feeding after the operation are indicated.

In prolapse of the liver, Davis states that he is coming to depend more and more upon shortening the suspensory and round ligaments.

For prolapse of the transverse colon, Coffey's method for suspending the stomach in a hammock by suturing the great omentum to the abdominal wall is advocated, since incidentally it holds up the transverse colon.

Davis states that most contributors to surgical literature of splanchnoptosis ignore the existence of enteroptosis, or consider that suspending the stomach corrects the entire trouble without any effort directed to the small intestines. Usually this is probably true, but sometimes the mesentery is stretched to two or three times its natural length.

Davis in these cases shortens the mesentery very much as Beyea shortens the gastrohepatic omentum, except that, instead of folding the membrane on itself by tier suture, only one suture is introduced between the arteriæ intestinæ tenuis, and when it is tied it produces a reef. Many of these sutures are used, and as they are tied the mesentery is shortened as much as desired.

The putting in of these reefs is not nearly so formidable as it seems. A number of cases are reported, one of which will sufficiently illustrate the technique.

The stomach was drawn up into its normal position, and the lesser omentum near its reflection upon the stomach at its lesser curvature was fastened to the peritoneum (in a transverse direction) at the level of the ensiform cartilage by means of fine silk sutures. The stomach was not especially dilated, and gastroplication was not performed. The transverse colon was fully six inches from the greater curvature, the gastrocolic omentum having been greatly stretched. A tuck was taken in the gastrocolic omentum, being careful to avoid the vessels, and not allowing the sutures to penetrate more deeply than through the anterior peritoneal layer of the omentum. This shortened the distance between the transverse colon and greater curvature of the stomach to two or three inches. The small intestines were now brought forward and the mesentery found to be so much elongated that the loops of intestine could be raised four or five inches

above the level of the abdominal wall without undue tension. Beginning near the upper end of the jejunum, a loop was brought forward. To shorten the mesentery without interference with the intestinal blood supply was the problem before the operator. The isosceles triangles, bounded at the base by the attached border of the intestine and having for their sides the arteriæ intestinæ tenuis, branches of the superior mesenteric, were elongated, the distance from their apices to their bases being three to four inches. Anything might be done to shorten these triangles if there were no interference with the circulation at their borders. A long, slender needle, carrying No. 4 silk, was inserted near the apex of a triangle, penetrating the mesentery in one direction and brought through in the opposite direction at the center of the base near the attached border. The suture was drawn through and tied, forming a reef in the mesentery at this point and shortening it from two to three inches. After several sutures had thus been introduced and tied in contiguous triangles, close examination showed that the circulation was unimpeded. Sutures were thus used the entire length of the small intestine, not in every interarterial space, but almost that closely. Between the upper jejunum and the ileocecal valve ninety-two sutures were employed. There was no shock. The patient did well with the exception of some pain in the region of the loosened adhesions. There was no distention. The bowels moved the third day. The patient was up the twentieth day, and left the hospital August 9, exactly four weeks from the day of operation.

UNDESCENDED TESTICLE.

Barr (*American Journal of Surgery*, January, 1907) holds that undescended testicle is at all times a surgical condition which should invariably be operated on before puberty, preferably between the ages of ten and twelve years. Even after puberty operation is still indicated, unless the testicle is within the abdominal cavity, and there is entire absence of hernia. He notes that the spontaneous descent of the undescended testicle is uncommon after the first year of life, and that in double cryptorchis, unless the condition be relieved, sterility is certain. It is often associated with impaired virility. Moreover, he calls attention to the fact that undescended testicle is liable to accident and disease, and is frequently complicated by hernia which cannot be supported by a truss. He believes that by operation before puberty there is more than a reasonable hope that the testis will develop along normal lines. If it cannot be brought down into the scrotum it should be replaced extraperitoneally within the abdomen.

Barr indorses Bevan's method of complete separation of the processus vaginalis from the cord, and its division, together with separation of the posterior and parietal peritoneum from the spermatic vessels as they pass upward from the internal ring, with a further tearing across of all fascial bands in the cords.

LOOSE KIDNEY—CHOICE OF PROCEDURE.

Morris (*American Journal of Surgery*, January, 1907) aptly remarks that many of the loose kidney patients of earlier days have to look upon their operations in an altruistic way, and have to be grateful only for the opportunity which they had for furnishing negative testimony for the benefit of the profession and incidentally for the benefit of the public. He gives a most rational classification of the cases in which operation is not likely to prove serviceable, including in this patients in whom loose kidneys cause really no disturbance, those in whom the abnormality is associated with minor psychoses not dependent upon loose kidney, and those in whom a loose kidney is only a part of a panoptosis of the abdominal viscera.

Morris advises the trial of abdominal supporters in all cases in which there is any doubt about whether the low kidney is "Hamlet in the play of symptoms." This

failing he suspends the kidney by a kangaroo suture entering the lower pole of the organ, carried along the dorsum for half its length, then across the other side, then down and out near the point of entrance. The two loose ends are made fast to any convenient muscular attachment, thus hanging the kidney where it is wanted. The lower pole of the kidney is then packed with iodoform gauze in such a way that the retroperitoneal pouch is distended. Gauze in a narrow strip is employed, one end of which is left outside of the wound. The sheath of the quadratus lumborum muscle alone is sutured, and that allows good approximation of deeper structures. The fatty capsule of the kidney is trimmed, and the fibrous capsule is split along the dorsum in order to give relief from the inflammatory tension. At the end of a week the iodoformized gauze is removed, and no further attention is required, excepting change of outer dressings for neatness. The patients are gotten out of bed at the end of fourteen days.

In this operation the kidney is properly suspended, and the gauze, which at first acts as a drain, will later by the adhesions which it causes obliterate the retroperitoneal pouch and fix the nephrocolic ligament.

Morris states that the only instruments he uses for the operation are a pair of scissors and a needle. There are no vessels which require ligation. The entire operation can be finished in fifteen minutes, and he has done the double operation in that time without working hurriedly.

REVIEWS.

HYGIENE OF NERVES AND MIND IN HEALTH AND DISEASE. By August Forel, M.D. Authorized Translation from the Second German Edition by Herbert Austin Aikins, Ph.D. G. P. Putnam's Sons, New York and London. The Knickerbocker Press, 1907.

The subject-matter of the work before us is divided into three parts: the first of which deals with the Mind, Brain, and Nerves in their Normal Condition, the second with the Pathology of the Nervous Life, and the third with the Hygiene of the Mental Life and of the Nervous System. The chapters of the first part embrace Psychology, the Anatomy of the Nervous System, the Relation of the Mind to the Brain, the Physiology of the Nervous System, Embryology and Race History of the Nervous System, and are written in a popular though very lucid vein. On the whole these chapters are very acceptable. Bearing in mind the extremely popular character of the exposition, close criticism is perhaps not called for; generality of statement is to some extent indispensable in a popular presentation of so complex a subject. The chapters on the Pathology of the Nervous System are likewise extremely condensed and thoroughly popular in their exposition. They are notwithstanding very clear, and the definition of the subject must be exceedingly valuable to lay readers. As an instance of the character and lucidity of statement the following may be cited: "The general characteristic of the mentally diseased, as contrasted with those who are at least partially sound, is the lack of insight into the abnormality of their own condition. This rests on the alteration of the whole personality, and this in turn upon diffused changes in the functioning of the brain, as a result of which the outer world and other people impress it differently, and the patient attributes this change to them and not to himself."

A brief synopsis of the various nervous and mental diseases is given, the exposition being on the whole satisfactory. However, like many of the continental writers, the author is not in touch with the western conception of the great functional neuroses. For instance, he fails entirely to recognize neurasthenia as a fatigue neurosis and hopelessly confuses it with hypochondria. He declares, for example, that "hypochondria is the principal ingredient in the *omnium*

gatherum of diseases thrown together nowadays under the name of neurasthenia." His interpretation of hysteria is likewise to say the least peculiar. He recognizes the element of dissociation in hysteria, but evidences a curious conception in regard to the rôle played by the disease. Thus we are told: "As a result of such dissociations it is possible for some overpowering feeling or idea to call forth various kinds of permanent paralyses, cramps, anesthesias, hyperesthesias, pains and all sorts of other symptoms of disease, fits of rage, sexual abnormalities, inhibitions, or strong irritations; but also, on the other side, ingenious pieces of work, the healing of these very diseases, enthusiasm for the good, self-sacrifice, heroic deeds, and, in short, everything that the human brain can prevent or produce. Hysteria as a disposition of the brain is to some extent a two-edged sword. It engenders an untold amount of evil and many misunderstandings, and yet delivers from many sufferings—and is misunderstood by very many physicians. Hysterical persons, misled or otherwise badly molded, can become devils; but if they are well-fed or of noble nature, they are often angels or heroes, like the Maid of Orleans." The suspicion is here justified that the author does not clearly distinguish between hysteria and paranoid states.

The etiology of mental disturbances is briefly and satisfactorily considered. We are, of course, impressed by the overwhelming rôle which the writer attributes to alcohol, a position which his well-known views on the subject would lead us to anticipate.

The section on the hygiene of the nervous system is, plainly speaking, disappointing. The writer again expends much energy on the rôle played by alcohol, which we read patiently, hoping to be rewarded in subsequent pages by a scientific discussion of the important subject-matter of the chapter. However, we are met with commonplaces and platitudinous statements regarding habit, training, exercise, feeding, and sleep. In vain do we search for a consideration of the problems of nutrition and diet, of tissue metabolism and elimination, which bear so vitally upon nervous health. Instead we find the writer making a vigorous onslaught on medicines, electricity, hydrotherapy, and physical remedies in general, as though the function of a chapter on hygiene was the discussion of medical methods. Upon every occasion also we find the author extolling the value of hypnotism—again not a surprising thing in Forel, but none the less disheartening. It is strange that hypnotism, now almost universally admitted to be merely hysteria artificially induced and proved by over a century of trial to be not only useless but dangerous, should still find its advocates, and in this instance in the person of an alienist to whom practical experience with the insane must have proved its utter futility. We are further disagreeably impressed by the writer's ungenerous and unjustifiable attitude to physicians in general, and somewhat amused by the specious advice he gives to patients in regard to the selection of a "reliable mental and nervous specialist." "Moreover," he says, "one should set aside his fear of the alienist. The director of a state asylum with his fixed salary, and exposed as he is in his thorny place to enmity and calumny through the gossip and lies of uncured or only half-cured patients, is the very person to offer good security, for the ground on which he lives is not adapted to the growth of fraud. His knowledge of the abnormalities of the human mind gives him practical wisdom which is usually lacking with other physicians. Many so-called nerve doctors who are accustomed only to sanatoria, and have confined their studies to the spinal cord and peripheral nerves, suffer from the great mistake that they do not know the center of their own field, the brain and mental disturbances." A passage such as this needs no comment; on the face of the American reader we observe a quiet smile.

The book, as might have been predicted, is in many respects an admirable exposition of the elementary science of the subject, marred by a rabid antialcoholism, a vaunting of hypnotism, and a denunciation of other methods. F. X. D.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.A., M.D.

The "silly season" is fast drawing to its close. Newspaper columns are still laboring to make bricks without straw. "Constant Reader" and "Indignant Citizen" are still pouring forth letters on "Slack Mothers" or "Are We a Stupid Nation?" But there are signs that London is coming home from its holidays. Editors are giving notice that "this correspondence must now cease," dusty blinds in West-end houses are beginning to be pulled up, and the loitering unemployed are watching for luggage-laden cabs which may bring them an honest penny for help in unloading. At the hospitals also, where whitewash and confusion have reigned supreme for weeks past, and beds have jostled each other in a disorderly crowd shrinking from the invasion of profane painters and polishers, order is now beginning to reappear, and medicine once more scorns to mingle with surgery, and each is reinstated in its separate ward.

With the first day of October students will return to the hospitals, and each medical school begins its session. This event is ushered in by an address delivered by some distinguished person, with a subsequent restorative in the shape of the "hospital dinner," a function which is patronized by the former students of the hospital, who turn up in force from all parts of the country. At St. George's Hospital, Dr. William Ewart will deliver the inaugural discourse, taking for his subject "Res medica, res publica"; at St. Mary's Hospital, Professor Osler is to be the speaker; at King's College Hospital, Dr. Allchin, the senior physician of Westminster Hospital, will speak on the present position of medical education in London. It is curious to note the change that has come over the spirit of the inaugural address: in years not very remote it was the custom for some member of the staff of each hospital to deliver the address, which was usually in part a formal welcome to new students, in part a homily to all the students, who were therein exhorted to follow all that is noblest and highest in the profession of their choice, and in general to walk worthily of their high calling. No doubt the interchange of speakers, so that each hospital has some distinguished visitor for the occasion from another medical school, has the advantage of promoting good fellowship between the hospitals, and it is good that these addresses should be made the occasion for public pronouncements on important questions concerning medical education or medicine in relation to the State. But still one cannot but feel that the old plan was good, and that there is only too little opportunity for teaching, from those whose years give them the claim to teach, the ethics and morals of medicine, which those who are just entering the profession can hardly be expected to learn by instinct; though indeed it would seem as if this were expected, for it is clear from the correspondence which only too frequently appears in our medical journals that on these points each medical man is a law unto himself, and his law is sometimes not altogether in harmony with that of his neighbor practitioner.

Considerable ill feeling has been aroused amongst the medical profession by the action of Parliament recently in passing the Notification of Births Bill. This measure, passed under the guidance of Mr. John Burns, the president of the Local Government Board, enacts that every birth shall be notified, and that any medical man attending the confinement or called to attend within six hours after the birth shall furnish a written certificate of birth to the local authorities within thirty-six hours after the confinement. The generous means by which this certification is to be insured is not the payment of a fee to the hard-worked doctor, but the infliction of pains and penalties if he fails to give the required document.

A remarkable case of gin-drinking at the age of three years and nine months

ended fatally in London this month. The child apparently drank nearly three ounces of neat gin, then vomited and became unconscious, with violent convulsions which lasted till death, about twenty-four hours after taking the gin. The parents declared that the child had never to their knowledge tasted alcohol before, but the medical evidence showed that there was cirrhosis of the liver, which was stated to be such as is produced by chronic alcoholism.

It is not often that a member of our profession lives to see his hundredth year, but the venerable figure of the Emeritus Registrar of the Royal College of Physicians of London is still to be seen walking about at his suburban home in his hundredth year. Sir Henry Alfred Pitman was born in 1808, and took his Bachelor of Arts degree at Cambridge in 1831; he was physician to St. George's Hospital from 1857 to 1866, and was knighted by Queen Victoria in 1883.

A medical man named Dr. Hirst met with a tragic end at Leeds a few weeks ago. He had been attending a man for mental disturbance, and after some delay it had been decided to certify the patient as insane and place him in an asylum. Apparently in the course of examining his patient the doctor had tested the knee-jerks, which the patient described as blows upon the kneecaps, causing "terrible epileptic fits." He attributed various sinister designs to the doctor, said that the doctor had killed him and deserved punishment, and, it is thought, may have gathered that the doctor had decided to put him under restraint. However this may be, one morning at six o'clock he knocked at the doctor's door, and when the doctor himself opened the door to him the lunatic fired two shots from a revolver, killing the doctor instantly, and then turned the revolver on himself and ended his own life. The doctor was twenty-eight years old and had been married only three months.

The mention of longevity in our profession reminds me that at the opening meeting of the Guy's Hospital Physical Society next week the chair is to be taken, as it has been in many a year past, by Sir Samuel Wilks, who after eight-three years and holding many offices in the University of London, on royal commissions, on the General Medical Council, in addition to the physicianship at Guy's Hospital and the onerous duties of president of the Royal College of Physicians, is still hale and hearty, and well able to fulfil the part of chairman at these annual functions. The speaker of the evening is to be Dr. G. A. Gibson, the well-known Edinburgh physician, for some years editor of the *Edinburgh Medical Journal.*

The appearance of new journals reminds one of Dickens's description of a snowstorm: "It snowed, and snowed, and still it kept on snowing." And still new journals come: the latest which is just struggling to the birth is the *Quarterly Journal of Medicine,* edited by Professor Osler and a group of well-known collaborators. It is to be devoted to the publication of original papers dealing with clinical medicine, and will include critical reviews on special subjects and diseases. Although it is not formally stated, it is to be presumed that this new journal is intended to bear much the same relation to the recently formed Association of Physicians of Great Britain and Ireland as the journal *Brain* does to the Neurological Society; it will be largely a medium of publication for the subjects brought forward at the yearly meeting of the Association, but will not exclude original papers from other sources.

It is satisfactory to note that at University College Hospital honor is to be paid to the memory of two members of the staff who have recently passed away—Mr. Christopher Heath, and Dr. G. Vivian Poore. The former was Emeritus Professor of Clinical Surgery; the latter was Emeritus Professor of Medicine. Both were familiar figures to us who are still in active service at the medical schools of London, and both were men who commanded love as well as respect; and in these days, when there seems to be so little appreciation of true worth, it is a rare but pleasing event, the unveiling of medallion portraits in the Entrance Hall of University College Hospital by the president of the Royal College of Physicians, Sir William Douglas Powell, next week.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series. Vol. XXXI. DETROIT, MICH., DECEMBER 15, 1907. Third Series. Vol. XXIII, No. 12.

ORIGINAL COMMUNICATIONS.

MEDICAL TREATMENT OF DISEASES OF THE GALL-BLADDER.[1]

BY JOHN H. MUSSER, M.D., PHILADELPHIA,

Professor of Clinical Medicine in the University of Pennsylvania.

It was not so long ago that a little girl was writing an essay on the rabbit. She had never seen a rabbit and did not know what it looked like. When she had finished she found she had said nothing about its tail. She asked her mother whether the animal had a tail. "Yes," the mother said, "but nothing to speak of." The little girl finished her composition by saying, "The rabbit has a tail, but you must not say anything about it."

This is somewhat analogous to the subject that has been assigned to me, for the present-day view of the pathology and medical treatment of gall-stones is similar to that of the rabbit's tail—a very small end of the subject—nothing to speak of. However, the subject is really one of very broad lines, and hence something, and much more than occurs to one at first thought, can be said about this condition: not the medical treatment of gall-stones, but rather the medical treatment of that state of the liver and the ducts, including the gall-bladder, on account of which there is a tendency to the formation of gall-stones—that is to say, cholelithiasis.

Notwithstanding the fact so well appreciated that if gall-stones are present and are doing mischief, the best thing to do is to have them out, it is nevertheless also well appreciated that there are many instances in which operative procedures cannot be resorted to. Hence we are forced to follow out medicinal lines of management in such cases. The age, the presence of intercurrent disease, and a number of other circumstances may render operative procedures absolutely inadmissible, yet for these classes of cases a great deal can be done medicinally, and perhaps the threatened storm induced by the presence of gall-stones can be allayed.

Preceding cholelithiasis there is usually a congestion or catarrh of the biliary passages, causing a stagnation of bile, with possible infection, and secondarily the formation of gall-stones. This hepatic condition has for its origin: (1) Toxic influences, arising from without or from within the body; (2) alterations of gastric or intestinal digestion, producing such modifications of the reflexes in the duodenal end of the stomach as to either limit or increase the hepatic secretion, thereby inviting the development of cholelithiasis; (3) circulatory conditions of the liver secondary to heart disease, either valvulitis or myocarditis, or perhaps even arteriosclerosis; (4) morphological conditions causing displacement of the organ. Congestions and biliary retention are the result of these conditions and are predisposing factors in the production of gall-stones. Added to these we have the last predisposing condition—infection. In a sense the latter may be looked upon as an

[1]Read at the 141st annual meeting of the Medical Society of New Jersey, June, 1907.

exciting cause, and yet we must admit it is not likely to be operative unless there is some change in the bile. If we recognize these etiological factors we can readily see that a large field for medicinal or hygienic therapy exists in cholelithiasis; and that, in accordance with our judgment as to the factors back of the disease, we must lay down varying plans of treatment. In a general way, then, it may be said that cholelithiasis demands etiologic and hygienic treatment; removal or modification of the cause, so far as this can be brought about. Further than that, however, there are specific measures, for we realize that with the catarrhal conditions often present more serious inflammatory states, such as that of cholecystitis or pericholecystitis, may be produced.

First of all, in an attempt to modify the cause, regulation of the diet must be considered one of the chief measures. Such regulation does not necessarily need to be one intended specifically for the liver. There are some who feel that a reduction of the diet is the essential thing. The patients in this class of cases are usually overeaters, and are giving their livers too much to do, if such an expression can be employed. In the larger proportion of the cases, independently of any classification as to the kind of food, if the intake of food be cut down one-half, you are taking the first and best step toward preventing or curing cholelithiasis. There is no doubt that independently of the pharmacotherapeutic value of the courses of treatment at Carlsbad and other places in having the patient drink large amounts of water which is medicated, the cures are largely brought about by reduction in the diet. If any specific lines of diet are to be enjoined, they must be those indicated more particularly by the need of the gastric and intestinal digestion. If there is a hyperacidity, a diet to meet this condition should be devised; if there is a subacidity or anacidity, the diet must meet this condition. If the stomach is dilated, or if there are evidences of intestinal indigestion, or of enteritis, or of mild catarrhal conditions of the intestine, a dietary to relieve this must be insisted upon. This is a 25-per-cent, or even a greater than 25-per-cent, measure in the step toward the relief of cholelithiasis.

Hydrotherapy avails much—water internally and water externally. The latter includes proper general baths and proper local baths. The use of alternate hot and cold douches over the liver, of hot and cold compresses alternately, or the continuous application of hot compresses for half an hour or an hour twice daily, when there are congestions or inflammations (cholecystitis, cholangitis) are not only valuable for the relief of the symptoms, but are also great aids in the relief of the cholelithiasis. We cannot insist too strongly also upon hydrotherapy by means of the general baths and the local douches or compresses as a means of contributing to the hepatic drainage.

Correct morphological conditions by the use of a properly fitted abdominal binder. In most of the subjects of cholelithiasis there is a ptosis of the liver and other organs. In fat subjects the binder is perhaps not so necessary, but when the abdomen is pendulous it seems to indicate that an abdominal bandage should be applied. I am quite sure that in a large number of cases of cholelithiasis the frequency of the attacks has been lessened, and perhaps their severity modified, by the wearing of a properly constructed bandage.

I need not dwell much upon the other hygienic measures that should obtain in carrying out the treatment for cholelithiasis. Perhaps, in speaking of the internal use of water, I should have said more about the drinking of waters than of the "cures." I feel very strongly that, unless gall-stones are doing a great deal of mischief, it is far more conservative to have our patients, if possible, take a good cure, either at Carlsbad or at one of the other resorts that are well known abroad, or perhaps at Bedford or Saratoga in this country. Thereby we shall at least relieve the complicating conditions so clearly brought out by the preceding

speaker before operative measures are resorted to. I have seen numbers of instances in which a quiescence of the calculi following subsidence of the inflammation has resulted. It is quite certain that after an operation the congestive or early inflammatory conditions are relieved by the rest, dietetic and hydrotherapeutic measures of a "cure."

Regarding the circulation I would say a word: One must study very carefully the heart and the vessels. I think that, as the liver is an organ containing a large amount of blood, the successful management of cholelithiasis cannot go on without a careful study of the circulation. The weak and dilated heart, the low tension, the evidences of modifications of pressure in the venous side of the circulation as indicated by the cardiosphygmograph, suggest remedies that should undoubtedly be employed when these conditions are present. In other words, the treatment of cholelithiasis is not only the treatment of the liver, or a local disorder, but is the treatment of the individual. One cannot follow fast rules with regard to its management. One should weigh all the features of the case, and from this structure and that organ get close indications for the treatment of that general condition which, if neglected, means the neglect of small factors that may have to do with the success or the defeat of any line of management.

Regarding the use of drugs in cholelithiasis, there are very few that can be administered with any degree of confidence that results are to be secured, save those indicated from a careful study of the gastrointestinal tract (including the stools and gastric analysis), those that are indicated by a study of the circulation, and those that are indicated by a study of the blood. The presence of anemia and other modifications of this tissue requires special treatment. If I were to name any drugs as having virtue in a general way, I should, of course, put the alkalies first. If there are congestions or a tendency to congestion or stasis, the old-fashioned remedy, muriate of ammonia, provided it is not contraindicated on account of gastric or gastrointestinal states, is of value. This drug has a direct influence upon circulatory conditions, and it also has an influence upon the secretions. It is a remedy, we are told, that thins the bile, allays the catarrh, and modifies the amount of mucous secretion.

The so-called biliary antiseptics come next in order—aspirin, salicylate of soda, or other salicylates. I have not been able to demonstrate it with the accuracy that one ought to, but I think that after the establishment of a biliary fistula the secretion of bile is undoubtedly increased by the use of these remedies; and I imagine, though I have made on this line no bacterial investigations and studies, that the microörganisms are lessened in amount. In other words, the bile infected gradually becomes sterile. How much this is due to the drugs and how much to the drainage I am not able to state; nor do I know how any statement of this character can be positively made. The use of phosphate of soda, of course, needs scarcely to be mentioned. The value of this remedy and of the sodium salts, up to a certain point, is well known. Whether the result is due to their action as cholagogues or to the fact that they relieve the stasis by purgation, it is impossible to say.

The gall-stone that is quiet in the gall-bladder or in the bile-ducts cannot be influenced by any medicinal treatment. There is no solvent for gall-stones, and there is no medicinal means for removing them. Of course, if there is a cholecystitis and a cholangitis, the measures that I have suggested are to be resorted to. If the gall-stone is putting the life of the patient in peril, or if there is arising in consequence of its presence a complaint that is menacing the individual, its management must be along the lines that will be so well given to you by Dr. Deaver. The use of olive oil is still thought of by those who speak of the solvent action for the remedial treatment of gall-stones. I have never seen any relief to the gall-stones from the use of olive oil, but I am bound to say that sometimes there is a relief to

the symptoms. Such relief, so far as I can see—and I think it is the consensus of opinion generally—is owing to the fact that with gall-stones there is usually a hyperacidity; and that, because of this, there is either simple gastralgia or pyloric spasm. It is these symptoms—the symptoms of hyperacidity—that are relieved when olive oil is administered, and it is the relief of these symptoms that causes the oil to get the credit of dissolving the gall-stones in the body. We all know, also, that when olive oil has been administered the patients can almost always bring the doctor a handful of pseudo-gallstones. I think we all agree that, even though there is a relief of the symptoms, the patients in most instances will soon come to the surgeon, because the symptoms continue, and something active must be done.

These, then, are in a general way the measures that can be resorted to for the medicinal management of cholelithiasis and of gall-stones. I shall not take up your time with any suggestions for the treatment of the complications of gall-stones, but will urge upon you the fact that it is only in a general way that we can hope for success in the management of cholelithiasis along medicinal lines. Its treatment is always not merely the treatment of a local process, but the broad, general management of a man that is sick.

Two further duties of the medical practitioner should be observed: First, to relieve or dissipate, as far as possible, all the complications of gall-stones before sending the patient to the surgeon; secondly, to select a surgeon of experience, and one who has a clearly thought-out technique. Only long years of patient work in experimental surgery and of training by a senior can fit the surgeon for the great responsibility of operating on such cases.

PRACTICAL POINTS IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE SKIN.[1]

BY L. DUNCAN BULKLEY, A.M, M.D., NEW YORK CITY,
Physician to the New York Skin and Cancer Hospital; Consulting Physician to the New York Hospital, etc.

GENTLEMEN—In the course of our clinical lectures and demonstrations of diseases of the skin during the past fall and winter I have many times called your attention to various practical points which experience had shown to be of importance in dealing with this class of affections. As many of these hints and suggestions have been given hurriedly and may have escaped you, I have thought it wise to gather some of them together into one lecture, and to endeavor to impress on you some of the elements which contribute to the successful management of many cases of this often troublesome class of diseases. If some things which I say may seem tc be homely and trite, I trust that this will be excused, for sometimes the most important things are those which are very simple and most often overlooked.

First let me say a word in general in regard to Dermatology. While this has often been looked upon as an almost hopeless branch for the general practitioner to rightly grasp, it is really one of the most inviting and interesting of all the departments of medicine; it is also one of the most important to cultivate in the entire range of the healing art, and a perfect knowledge of it, in all its relations, will better prepare the practitioner for general usefulness than will that of any one other so-called specialty. The habit of careful investigation and minute observation which is necessary in order to fully comprehend and to successfully treat diseases of the skin cannot fail to be of the very greatest possible service in every-day practice, while the satisfactory results which follow from an exactly proper treatment will not only strengthen faith in therapeutics, but will teach much in regard to its principles.

[1]Lecture delivered at the New York Skin and Cancer Hospital, March 27, 1907.

Diseases of the skin are too often thought of as something peculiar and quite different from diseases affecting other organs of the body; whereas they are governed by exactly the same pathological laws which operate elsewhere, and, indeed, the skin affords a most fertile field for pathological research, which has also contributed much to our knowledge of medicine in general.

Diseases of the skin are also too often regarded as loathsome, and are popularly considered as being mostly contagious; whereas large statistics show that syphilis commonly gives only about ten per cent, and the parasitic diseases about the same proportion, or together all these contagious diseases form only about one-fifth of all cases.

Again, inasmuch as very few of the diseases belonging to dermatology endanger life, and because so many of these conditions seem to relate largely to the comfort or even pride of the patient, this department of medicine has not, in general, received as much consideration as its importance really warrants. It should be remembered, however, that not only does the physician seek to save life, but, as all know, a large share of the work of the medical man in every department of medicine actually does consist in ministering to the comfort of the patient, and in restoring human beings to as near a normal state as possible. And let me assure you from long observation that a serious disfigurement is with many persons more hard to bear than even severe pain.

But then, further, a trouble on the skin may often act as a most serious drawback in the way of securing the occupation necessary for support. A moment's thought will convince any one that even *acne,* if at all severe, might greatly handicap a person seeking very many lines of occupation: for, with two applicants possessing equal qualifications for a position, every one would naturally choose the person who had a clear, attractive complexion, in preference to one greatly disfigured with acne. Even so relatively harmless a matter as a conspicuous and unsightly *vascular nevus* on the face would deter many a person from occupying a public position, and might hinder one from securing occupation; while the misery suffered by some females on account of a growth of *superfluous hair* on the face is often far greater than that caused by bodily ailment. Many more illustrations will arise to every one, of often more than inconvenience caused by skin lesions, and I will mention only one or two instances more. All will appreciate how *eczema* of the hands often seriously interferes with the occupation of laundresses, cooks, waitresses, and others, and few would want to be served by a barber who had any manifestations of a skin disease. Even *ringworm,* which is often so slightly regarded by the general profession, can work havoc in an asylum or school, and by isolating children from school can seriously interfere with education.

My first practical suggestion, then, is that every practitioner should acquire the best possible acquaintance with the diagnosis and correct treatment of cutaneous manifestations; and as a corollary to this, that he should always pay the strictest attention to any abnormality of the skin, and seek to interpret and care for it rightly. Nothing which is of sufficient consequence to lead a patient to consult a physician should be too small or insignificant to induce the medical adviser to devote to it sufficient patient observation and thought to enable him to determine its true nature and bearing on the life, health, and happiness of the individual affected. All this may seem trite and out of place, but I am convinced that this caution is needed by many who are altogether too careless and superficial in regard to any trouble on the skin. A very interesting and profitable chapter could be written on the beginnings of diseases and how they can be checked; undoubtedly multitudes of the lamentable cases of epithelioma would never have reached their often incurable state if proper attention had been given to their very early stages.

As correct diagnosis must lie at the bottom of all truly successful therapeutics, let us give a short time to this subject from its

practical aspect; and you will pardon me if I seem to be somewhat dogmatic, for I know that you want me to give you the benefit of my personal experience.

Do not be too hasty in making a diagnosis. If one could realize and appreciate the patient investigation which is commonly practiced by a careful specialist in making a correct diagnosis, it would be readily understood how it is that those less acquainted with this branch cannot often, with certainty, determine the matter with a brief glance.

It is always well to endeavor to arrive at a definite diagnosis, which shall be committed to writing in connection with the history of the case. And here let me urge most strongly upon you the practice of careful note-taking, and also that of note-keeping, at each visit. For nearly forty years I have persistently made notes each time I saw a patient, before prescribing, entering also the prescription in connection with the symptoms present; and I can assure you that the practice is of the very greatest value, for it assists in crystallizing one's thought of a case, and is most serviceable as a guide for future treatment.

In connection with making an accurate diagnosis let me urge upon you the importance, and even the imperative necessity, of examining each and every portion of the affected surface, even if patients remonstrate and think it quite unnecessary. They will often insist that all the eruption is quite like the small portion which they may first exhibit on an exposed surface, when on close inspection it will be found quite otherwise. Indeed, in many instances the diagnosis will be quite different from that which was first supposed from the sample presented for inspection; in certain cases it is quite impossible to decide absolutely on a diagnosis without a very careful examination of every lesion, and sometimes it is necessary to go over them more than once. It is often very desirable to examine also the entire surface of the body, the patient being stripped, in order that one may understand the proper relation of the lesions, and also appreciate the character of the unaffected skin. As an illustration of this I may remind you how often we have done this in the clinic, and how in *scabies* it is necessary to search every place where we know the lesions are apt to manifest themselves.

Let me also urge you always to seek for and determine, if possible, the *primary lesions,* or earliest manifestations of disease on the skin, in every eruption, for from them you can best determine its true nature. This you have often seen me do in the clinic, and as a single illustration of its value I may remind you how difficult the diagnosis of *lichen planus* has sometimes been, until we found the characteristic purplish, shiny, flat papule, depressed in the center, perhaps on some distant part.

In this connection I wish further to impress upon you the value, and even the necessity, of using a good lens or magnifying glass in studying cutaneous diseases, as you have often seen me do. It is not because one cannot see well, but in some way the skin lesions appear differently, and are seen to stand out more clearly, when magnified. In earlier years I was somewhat skeptical about this, but during repeated visits to the clinics abroad I have so constantly seen the best men work in this way, and I have myself for many years found it of such inestimable advantage, that I cannot too strongly impress the matter upon you.

But in making a diagnosis one cannot always trust simply to the impression which the actual condition of the skin makes on the mind, for you know that eruptions often resemble each other very closely; much aid in diagnosis may undoubtedly be obtained from a carefully-drawn-out history of the appearance and development of an eruption, which, however, is sometimes very difficult to obtain clearly from a patient.

There is also another method which you have seen me constantly employ, and that is the one of *differential diagnosis.* You remember that we have often had written on the blackboard half a dozen or more diagnoses which have been suggested by those present for some particular case exhibited, many of which diagnoses were very

well founded, as the eruption in a measure resembled each of them. Then you know how, by recalling this or that feature belonging to each of those eruptions mentioned, as perhaps present or absent, by a process of exclusion we have eliminated one disease after another, until we have found the one which answered all the requirements of the case before us. This process should be employed, mentally at least, in every case more or less, except perhaps the simplest; and I am confident that if this were more often resorted to dermatology would seem a more pleasant and attractive field of study and practice, and better success would follow in many cases. For this reason, in the last edition of my Manual of Diseases of the Skin, I added a separate "Diagnosis Index," in which reference was made, under each disease, to the other diseases of the skin which might be confounded with the one under consideration.

In making a diagnosis of a cutaneous disease the possibility of its being due to or influenced by *syphilis* should always be borne in mind, even in those who might not be suspected of any sexual transgression; for syphilis is no longer looked upon as wholly a venereal disease, and "syphilis in the innocent"[1] is now such a well-recognized fact that I need not dwell much upon it at this time, as I have so frequently demonstrated it in my clinical lectures. Therefore, in analyzing a case, if the skin lesion is at all suggestive of syphilis the matter should be thoroughly investigated, and the question determined with certainty.

To properly appreciate and recognize diseases of the skin it is essential to have good light—a northern light is best—and artificial light should never be relied on in doubtful cases. I may also add that for parts which are ordinarily covered with clothing or dressings it is often desirable to expose them for a while to the action of the air, when their characteristics or peculiarities will sometimes become more apparent: for example, an early macular syphilide will commonly become more visible after the patient has been stripped for a few minutes.

[1]Bulkley: Syphilis in the Innocent. New York, 1894.

TREATMENT.

Turning now to treatment, let me give you some practical suggestions which occur to me from my daily contact with this class of disease, especially in private practice.

First let me remark that while a correct diagnosis is of prime importance, diseases of the skin are not to be treated wholly from this aspect, if one would obtain the best results. In my special lectures here last spring,[1] and in those of the year before, I have urged this matter so much that I hesitate to dwell on it now. But I so constantly see this done by others, with bad results, that I cannot help again cautioning you against it. Time and again two or more patients presenting cutaneous affections with quite different names will receive much the same treatment, with advantage, and again two or more different patients, to whose skin lesions the same diagnosis is given, will receive quite dissimilar treatment, also with the best results.

Hence it follows that the patient is to be considered and treated quite as much as the diseased condition of the skin; for it must be remembered that the skin is only a part, and a very important part, of the general organism, and that its diseases are often dependent upon disorders of internal organs, as I have so often said.

Let me therefore urge you to approach most cases of skin diseases very carefully and seriously, and to endeavor to discover where the fault lies, and to rectify it; rather than to be content with giving this or that local treatment alone, whether it be one advised professionally, or possibly one presented by some clever, though impudent, advertising firm. I recognize, of course, that some affections of the skin are local in character, and removable by local measures; but even in many of these there will often be some underlying cause, predisposing the skin to take on morbid action, which medical acumen should discover and medical skill should overcome.

Let us consider then the general subject of treatment from the two aspects of (1)

[1]Principles and Application of Local Treatment in Diseases of the Skin. Rebman & Co., New York.

constitutional, and (2) local, and note some practical points related to each. We cannot, of course, in the time at our disposal enter fully into the treatment of particular diseases, although some will be mentioned for the purpose of illustrating the matter in hand.

Cutis sana in corpore sano is an equally true dictum with *mens sana in corpore sano.*

We all know how a clear, ruddy, immaculate skin is universally recognized as a sign of perfect health and vigor, and most people admit that a sallow, muddy skin, or one dry and harsh, is a sign of ill health; and yet frequently the physician looks only at the local manifestations of disease on the skin and seeks to remove them by outward applications alone, instead of seeking for the causes and endeavoring to remove them as well.

Arsenic has, in some way, become so intimately associated with skin affections in the mind of the profession and laity that it would perhaps not surprise very many if they should know how continually the specialist finds that the only attempt at internal or general treatment which had been previously advised was a course of arsenic, and that for the most diverse cutaneous manifestations; but he might be somewhat surprised if he knew how little good had been effected thereby, and also how relatively seldom this course was pursued by the careful and skilled specialist. In my lectures year before last[1] I dwelt strongly on the internal relations of many diseases of the skin, and tried to show the various lines along which proper treatment should proceed, and will not enter into the matter largely now; but I must remind you of it as one of the most practical points which I can offer in regard to treatment.

Diet must be of importance in connection with many diseases of the skin, for we constantly witness its effects in certain conditions: thus, all are familiar with the outbreaks of *urticaria* after the ingestion of certain substances, and any one who watches patients with various eruptions for a long time will observe an aggravation after dietary indulgence, as, for instance, *acne* will often blossom out after the free use of nuts, pastry, sweets, etc.

Unfortunately definite and reliable observations have not accumulated in sufficient numbers to admit of positive statements in regard to the exact relation of diet to many cutaneous diseases, and time would not permit of my entering largely into this subject; therefore I must refer you to what I said in my former lectures. But I may here call your special attention to a few practical points of particular importance.

In some of the acute erythematous and bullous eruptions, and in acute and pretty general *eczema,* I have found the greatest advantage, indeed the gain is often marvelous, from a very great limitation of the diet, for a short time at least. In many of these cases I have had the patient take absolutely nothing for a few days except rice, bread and butter, and water at each meal; the rice I have boiled in water and steamed, so as to be dry and light, and eaten only with butter and salt, and *not* with milk and sugar.

This leads me to speak of milk, which I often find to be harmful, as ordinarily used, in many diseases of the skin. When taken by adults in connection with food it often induces a bilious state of the system, which greatly aggravates many skin conditions. This is especially true in *acne,* and in many a case I have found a greasy, muddy skin, with many large and small acne lesions, clear up quickly, with appropriate treatment, when the practice was discontinued; and in some instances, where the eruption has been rebellious and when I had not previously given specific directions in this matter, I have found that patients were erring greatly in this respect, and rapid improvement followed its correct regulation.

I have so often gone over this subject publicly and in print that I will not dwell long on it now; but for those who are not familiar with the plan which I have long practiced, and which has received support and commendation from so many physicians,

[1] Bulkley: The Relations of Diseases of the Skin to Internal Disorders. Rebman & Co., New York, 1906.

I will very briefly mention the main points involved.

In order to avoid the coagulation which necessarily takes place when milk meets the acid reaction of the stomach during digestion, I have it taken only during the alkaline tide, which, with healthy digestion, occurs generally about an hour before eating, or from three to four hours after eating an ordinary meal; when there is sluggish digestion and food or its remains linger in the stomach from meal to meal, the plan does not work, but generally with the aid of artificial digestives, and perhaps with a little alkalinization of the stomach with bicarbonate of soda, it can commonly be accomplished.

The plan, then, is to give milk alone, pure or diluted with boiling water, at the body temperature, just after the alkaline tide has set in, or during its continuance, and to avoid food or any substance which could call forth gastric secretion until after its absorption has been fully accomplished: this, as will be seen, is quite different from the ordinary plan of eating a cracker with it, or putting an egg or liquor in it, which quite frustrates the object to be accomplished, namely, the rapid absorption of the milk as such without its passing through the processes of caseation and ordinary digestion. Whatever the physiological explanation may be, from very long experience, in many hundreds of cases with most divers complaints, I can hardly express to you strongly enough the value of this method when it is intelligently and thoroughly carried out. Dozens or even hundreds of patients can testify to the supreme value of milk when thus correctly used.

Mention was also made a while ago of restricting many cases of cutaneous disease to a strictly vegetarian diet, and I wish to call your special attention to the great value of this plan in *psoriasis*. Some ten years ago I wrote on this subject, and since that time I have been able to watch a fairly large number of cases in which this plan has been instituted and carried out with more or less persistency, and I can say that I am more and more convinced of its value. I have seen a number of cases in which a return of the eruption was directly traceable to indulgence in meat, and I have seen many cases, some of them dating back for years, remain free from eruption under an absolutely vegetarian diet.

Perhaps you know that this principle of living has obtained a strong hold in England, and in London there are very many restaurants where a purely vegetarian diet is furnished, and which are crowded with customers. Many of my patients express the greatest satisfaction with this mode of life, feeling better and even gaining good flesh, as shown by weight on the same scales at each visit. One need not wonder at this, for the herbiferous animals are among the strongest and healthiest, and in athletic contests in England, and also during the past year at Yale, it has been shown in every contest that the meat-eaters fall far behind the flesh-abstainers in every test of endurance. Under vegetarian diet I exclude even eggs and fish, giving only substances that grow from the ground, with the exception of butter; in many instances I have also excluded tea and coffee, and of course all fermented or spirituous drinks.

I need hardly mention to you that these latter two are harmful to most congestive or inflammatory diseases of the skin, and it is a very practical point that this matter should always be mentioned, if there is the slightest suspicion of its necessity. I have seen many cases of *acne* in middle life which resisted treatment as long as any form of spirituous drinks, even wine and beer, was indulged in, and the same is true in regard to certain cases of *eczema*. This is particularly true in *syphilis*, and a Frenchman wrote a thesis some time ago in which he showed that many of the late and often ulcerative lesions of syphilis occurred mainly in those who indulged in any beverage containing alcohol. Every syphilite should be a total abstainer.

Sweets, you know, are largely contraindicated in many diseases of the skin, but let me make the practical suggestion that unless the physician keeps this matter constantly in view and under surveillance there

will be errors which will pretty certainly hinder the progress of the case, as is constantly seen in *acne,* etc.

Coming now to the *internal medicinal* treatment of certain diseases of the skin, there are many practical points which it is well to bear in mind.

First, let me urge upon you the very great value of repeated and very careful and complete, even quantitative, analysis of the urine as an index of the manner in which metabolism is being carried on, which is often of such very great importance in relation to many cases presenting cutaneous eruptions. I do not refer to the discovery of albumin and casts or sugar in the urine, and you would be surprised to know how seldom these are found in my laboratory, in the urine of those coming for treatment; and yet many a physician in consultation will assure me that the urine is all right, simply because there is no albumin or sugar, when my analysis will yield points of the greatest practical importance in regard to the management of the case.

Do not forget the physiological relations of the blood and the urine, and how perfectly the latter portrays the condition of the arterial blood on its way to nourish the tissues. Remember that the current of arterial blood in the renal capillaries is separated by only a few layers of cells from the cavity of the secreting tubules of the kidney, and that the urinary secretion is more or less of a filtration, at least a separation, of elements which, after having passed the action of other vital organs, are seized upon by the kidneys to be removed from the body. Remember that the kidneys are the last court of appeal as to what should constitute good blood, and that they offer the final chance of removing substances which should not be in its current, in order that it may properly nourish the various structures of the body.

Viewed in this light the exact composition of the urinary secretion may often bear a very important relation to certain diseases of the skin. Not only its *quantity* and *specific gravity* and total *excrementary solid constituents,* but also its *relative acidity,* accurately measured from time to time, afford a most valuable indication in regard to the employment of various internal medicaments, and often explain many symptoms and the reasons for the ineffectiveness of certain remedies. *Indican* in the urine, in any quantity, is also often a very important element to recognize, as indicating intestinal fermentation and consequent autointoxication, which has much to do with many cutaneous manifestations. The relative output of *urea* is also of significance, as it has been shown that in certain diseases, notably *dermatitis herpetiformis,* a fresh outbreak of eruption followed many times in succession upon diminished excretion of urea.

All are, of course, familiar with the indications given by the presence of uric acid, urates, oxalates, and phosphates microscopically in the urine; but the volumetric analysis of the phosphates, chlorides, and sulphates, with their varying proportion, is also equally important in certain cases, as indicating the character of the blood stream, which certainly has much to do with the nutrition of the skin and other tissues, both in health and disease. There are other elements sometimes of importance in the urine, as an indication of the mode of performance of the metabolic processes in connection with certain diseases of the skin, which I cannot dwell on now. But I have said enough, I think, to show you that in certain of the more chronic and rebellious forms of diseases of the skin this is a practical point indeed, and that close and frequent attention should be given to the urine as a constant aid to treatment.

As the condition of the urine largely depends upon the action, perfect or imperfect, of other organs or parts of the body concerned in metabolism, I want to urge you to bear continually in mind the action of the liver and intestines in most patients with diseases of the skin. You would be surprised if you knew how many patients one sees in whom these matters have been entirely neglected by former physicians in

charge, who have had regard mainly or almost exclusively to the local treatment of the lesions on the skin, while these functions were in a deplorable condition. The influence of modern medical teaching has been rather away from active interference in these matters, and patients are too often left to care for themselves in this respect, and naturally turn to the many quack and semiquack remedies so freely advertised or offered in the drug stores. You have so often seen the good effect of the blue mass, colocynth, and ipecac pill, of which I have frequently given the formula in the clinic, that I need not say much in regard to it now. But I will say that as a practical aid in handling hundreds of cases it has done me yeoman service, and I commend it most heartily to you. It is not an infrequent thing with me to give a course of two of these pills on alternate nights, on the same day of the week, even for weeks together, when patients are taking strong alterative tonics; and I am sure that I get very much better results in this way than when this matter is neglected.

Some of you who have attended the clinics in years past may have noticed how frequently I prescribe acetate of potassa, even in a number of quite different skin affections. And I wish as a practical point to advise you to make considerable use of it, for many years' experience has taught me that it is of the greatest value, and in the long run serves better as an antacid than anything else with which I am acquainted; and I have made more or less use of almost everything that has been well recommended. You have repeatedly seen how, when taken with nux vomica and the fluid extract of rumex root, perhaps with a little cascara, freely diluted, half an hour before meals, it has worked a radical change in many cases of congested *acne,* especially in *acne rosacea.* In *eczema, psoriasis, lichen planus,* and some other complaints I have commonly given it, with nux vomica and a bitter infusion, as quassia, after meals, with cooling effects: it certainly acts thus as a diuretic in a most efficient manner.

Time would fail if I attempted to go at all into detail regarding the internal medicinal treatment of individual diseases of the skin, but I have said enough to show you that I am a firm believer in the proper constitutional treatment of a large share of maladies which affect the skin; with, of course, an intelligent use of local measures, along the lines which I attempted to point out in my special lectures last year. I am certainly not a therapeutic nihilist, for I believe that with proper skill, assiduously and carefully applied, the vast majority of cutaneous diseases can be satisfactorily treated and cured, although every one who has seen much of this branch of medicine must admit that many of them resist treatment in a most discouraging manner; but even in these cases, if the proper treatment is persisted in for a sufficient length of time the result is satisfactory.

As a single illustration of this I wish to recall to your memory the case of psoriasis, Rebekah, who was in the hospital several times, and whom I have shown in the clinic so frequently. I have more than once exhibited her as about the worst case, and most rebellious, that I had met with, and one year ago I brought her before you almost entirely covered with large red areas, in a condition which simulated *pityriasis rubra:* all the nails of the hands and feet were intensely affected, and she was in a pitiable and distressing condition. And yet, one week ago I presented her to you with a perfectly free skin, as delicate and fine as could be desired, without a trace of psoriasis, nor had she had any eruption for over six months. In her several previous stays at the hospital she had had almost every conceivable form of treatment, internal and external, and would at times go out almost well, but the psoriasis would return in a month or so. During the last stay in the hospital the eruption had resisted and had gotten worse under most varied treatment up to the time spoken of, a little over a year ago.

She was then put upon an absolutely vegetable diet, and was given strong nitric

acid internally, four drops, well diluted, after each meal. The improvement was almost immediate, with no local treatment, except some emollient application, and within a month areas of sound skin appeared; and the improvement increased as the amount of nitric acid was increased, until in the summer she was taking ten drops of strong nitric acid, well diluted, three times daily, the vegetarian diet being strictly adhered to. In a very short time after beginning this treatment all local medication was omitted, nor has she had any external applications since; and as you saw last week, the skin of the entire body is as soft and perfect as could be desired. Nor do I expect a return of the trouble if she will continue treatment sufficiently long, for she has been absolutely free from eruption for fully six months; whereas heretofore it returned almost immediately after it was removed.

Now I cannot tell you exactly how this treatment operates, nor do I advise precisely the same in every case of psoriasis, although I have seen it thoroughly successful in a number of other cases. But I do insist on two things: First, that it demonstrates that psoriasis is not a local disease of the skin, but that it depends upon some as yet unknown constitutional state, probably one of suboxidation; and while local treatment may place the skin in such a condition as will resist its influences for a season, yet while the underlying cause remains it readily takes on the same pathological changes, probably from the action of some microörganism almost universally present, but as yet not determined. Secondly, inasmuch as the eruption will sometimes cease, even permanently, under other internal treatment or change of habits, mode of life, climate, etc., medical skill and knowledge should by patient search and endeavor find the error and rectify it. I cannot go into this subject more fully now, but must refer you to what I have elsewhere written in this connection.[1]

[1] *Journal of the American Medical Association*, Nov. 17, 1906.

Before finishing this lecture with some practical suggestions in regard to local treatment, I would like to say a few words in regard to the treatment of *syphilis* which I consider of practical importance.

While syphilis is an infective disease, caused by a definite poison, it is well to remember that it is not self-limited, as are most other infectious or contagious diseases, but that continuous or properly intermittent treatment should be pursued until such a time as experience has shown that the disease is fully eradicated. I cannot enlarge on this now, but I do want to impress upon you the great responsibility which a physician has when consulted by a patient with syphilis, both in the matter of guarding others against contagion and also in reference to the danger to the patient resulting from neglected syphilis attacking the arteries, the nerves, the eyes, and vital organs. Every one who sees much of syphilis meets with deplorable cases, in which the unnecessary damage already done could have been averted by timely and efficient treatment. I find that patients in private practice are keenly alive to this, and if the physician is frank and earnest and insistent, they will be proportionately obedient and faithful to treatment.

I am one of those who believe in the radical cure of syphilis, although I am not prepared to say absolutely how long specific treatment should be continued to effect this result. Fournier has lengthened the formerly accepted time of two years to from three to five years.

I want also to impress upon you the fact that although syphilis is a definite infective disease, there is very great difference in the individuals who are attacked, and in their power of resisting the effects of the poison. This may seem a trite and useless remark, but I so constantly see cases in which this principle or thought has seemed to have been ignored by those who had seen the patient previously that I cannot help mentioning it. While mercury and iodide of potassium are the remedies for syphilis and must be used sufficiently to eliminate the

disease, the patient with syphilis may at one time or another require the most varied treatment to meet this or that condition of the system, which may at times interfere with the efficient action of the specific remedies; and the physician who is responsible for the course of the specific disease should see to it that the human frame in which the poison is operative is in the best condition possible to resist the effects of the syphilitic poison. Those who have attended these clinics know that as a rule, except in the earliest stages of the disease, I prefer a mixed treatment, in one solution, and, as I believe syphilis to be depressant and exhaustive, I commonly add iron and bitter tonics; and I feel confident from long experience that this brings better results than such treatment as is sometimes given.

Local treatment of diseases of the skin is, as you know, sometimes a perplexing problem; and to judge from the many patients I have seen who, by the advice of physicians, have been using some of the various "cure-alls" so urgently advertised and pushed before the profession and the public, I should imagine that the ideas of many general practitioners were not very well crystallized or fixed on this subject. In my special lectures of last year[1] I entered so fully into the principles and application of local treatment in diseases of the skin that I hesitate now to dwell on the subject very much. But as mention of these matters may have slipped your attention I think I can with advantage refer to some of the most practical points in a brief way.

In endeavoring to benefit an eruption on the skin, I told you that one should seek to have a clear idea of what was to be accomplished, and I showed how unreasonable it was to suppose that any single remedy or combination of remedies could be "good for diseases of the skin," as the advertisements so impudently assert. There are many aims to be accomplished in different eruptions, and even in the same disease in its various stages; moreover, the skins of different patients often react very differently under the same local remedy.

In deciding on a local application, therefore, determine well what the condition of the part is, and what you wish to accomplish; for the remedial measure should vary greatly according to whether it is to be (1) protective, (2) soothing, (3) astringent, (4) antipruritic, (5) emollient, (6) stimulant, (7) absorbent, (8) antiparasitic, or (9) destructive. Often several of these objects will be combined and the prescription varied accordingly. I cannot, of course, go over all these matters again at the present time, but I only want to emphasize the fact that the skin is an organ possessing in itself exceptional healing powers, as is seen in the case of wounds and surgery, and one which responds remarkably well to an appropriate dressing, while one that is ill-advised produces only harm.

Applications to the skin are made in the form mainly of powders, lotions, plasters, and ointments, and I would like to say a few words practically in regard to some of those combinations which you have seen used in the clinic, the formulæ for which appeared in my lectures of last year.

Powders have a very limited use, but at times are of service. Thus in *herpes zoster* the very greatest relief is given by dusting the surface thickly with a powder in which there is a little acetate of morphine, and binding the parts firmly with muslin, sewing it on if necessary; while an ointment will often cause an ulceration of the surface and much subsequent trouble. Slight papular *eczema* in an infant is often allayed by a mildly astringent powder better than by any other dressing. But, on the other hand, care must be exercised in attempting to check the intertrigo between folds of the skin with a powder, as this will often make a paste with the acrid discharge, and only increase the difficulty. *Urticaria* will often be greatly relieved by free dusting with a powder containing chloral and camphor well rubbed in.

Lotions have a wider range than powders,

[1] Principles and Applications of Local Treatment in Diseases of the Skin. Rebman & Co., New York, 1907.

and form a valuable part of the dermatological armamentarium. You have constantly seen the beneficial effects of the calamine and zinc lotion, as it has been used in the clinic, in allaying *erythematous* and slightly *eczematous* conditions, and in those it is often far superior to any ointment. A more astringent application is found in the magnesia and zinc lotion, which is often peculiarly agreeable and effective about the anogenital region. You have also frequently observed the excellent results of the lotio alba in several forms of *acne:* this may be strengthened by the addition of a drachm or two of precipitated sulphur in the four ounces; where it is too drying, half a drachm of glycerin may be added. Ichthyol is also often of the greatest service in watery solution, ten to twenty-five per cent, bathed over *pruritic surfaces* and allowed to dry on; other lotions or an ointment may be applied over this with advantage.

Plasters have been strongly recommended by many, but I have not employed them as largely as some, although occasionally we find them of great service; they are not, as a rule, very applicable to any acute eruptions, but in some chronic lesions they are decidedly serviceable. Old patches of *eczema* or *psoriasis* sometimes yield excellently to a salicylic acid plaster, three to five per cent, or even stronger, as made by certain manufacturers. Old *syphilitic lesions* often yield better to the application of mercurial plaster than to any other means: this is also frequently of great value, in both *lupus vulgaris* and *lupus erythematosus.*

Ointments are, of course, the most commonly employed form of application to diseased skin, and always will be our mainstay; but, as remarked before, they must be greatly varied to suit the case in hand. It must be remembered, however, that some skins do not bear fatty matters well, and also that the ointments furnished by all druggists are not uniformly satisfactory: frequently they are old, and they may become rancid. Moreover, the ingredients are not always perfectly mixed—I have frequently found them very gritty. I would advise you to look well into these matters, and to be sure that any application to the skin is most perfectly compounded.

I do not care to employ the ointments made with lard, as are most of those described in the Dispensatory, but invariably order them freshly compounded with good, sweet, rose ointment, or cold cream, the unguentum aquæ rosæ of the Pharmacopœia, which in my experience forms the best application to the skin. Vaselin is not a satisfactory base for many ointments, even when stiffened with paraffin, wax, lanolin, or spermaceti. Some skins will not tolerate vaselin at all, but when a soft, lubricant quality is desired, the albolene ointment answers very well. An exception in regard to vaselin is found in the so-called Lassar's paste with salicylic acid, which you have seen so frequently used with advantage in the clinic. Let me remind you of the value of the diachylon ointment, properly made according to the formula of Hebra, of which I have so often spoken.

Zinc ointment is certainly a valuable remedy, although as ordinarily furnished by the druggist it often proves anything but soothing. I never order simply zinc ointment, but always direct it to be freshly made, with cold cream, generally half a drachm to the ounce, to which I frequently add a scruple of prepared calamine, and five or ten grains of carbolic acid.

This subject of the proper composition of ointments is a very large one, and I must not further dwell on it, as I presented the subject so fully in my lectures last spring. I want to mention a few practical points in regard to the mode of making applications and removing them, for in these matters often lies the secret of their successful use.

Most patients if given an ointment will simply rub a little of it on, and cover it more or less imperfectly with old linen or gauze, which soon absorbs the greasy element, and leaves the other ingredients pretty dry on the skin. Now in the large share of eruptions this is entirely wrong. If the eruption is at all acute, this will only

irritate and inflame the surface. I commonly have the proper ointment spread pretty thickly on the *wooly* side of sheet lint, laid over the affected surface, and then kept in place by proper wrappings. Here let me remind you of what is known as the circular bandage, which is a broad, woven webbing of rubber, made into circles, like garters, which are sprung over the parts. For the treatment of eruptions on the arms or legs this is most excellent, and patients are delighted with the ease with which they can thus carry out treatment; on the body or head this is rarely applicable, and great ingenuity will often be required to keep applications in proper position. Let me also remind you of the value of very thin layers of absorbent cotton as a covering on many parts of the body, as about the face, the feet and hands, and in the genital region: with a little care this can be spread with an ointment and applied closely to the affected parts, as I demonstrated in my second lecture last spring.

I want also to recall to you what I have so often said in the clinics, how continually patients err in not keeping a proper application upon a diseased surface for a sufficient part of the twenty-four hours. It is not enough that the parts should be well covered and protected at night, but with many eruptions we can get the best results only when the proper remedy is kept in contact with the diseased surface all the time. Sometimes on exposed portions of the body it will answer pretty well if after the application is made again thoroughly in the morning it is left on for a while only, and then, when the patient must be presentable, the ointment is gently wiped off, but not entirely; in this way a slight film is left on, which both protects the part from atmospheric influences and exercises somewhat of a healing effect. These may seem small matters to speak about, but attention to details has everything to do with success in dermatology, as in surgery and other branches of medicine.

The right and wrong use of water in connection with the skin in health and disease is also a matter in regard to which patients will often err unless correctly instructed. This is a large subject which cannot be discussed here, but I will briefly state the results of my observation and experience. While cleanliness is certainly desirable, I find many persons who carry the practice of washing and bathing to an injurious extent, and who freely acknowledge the benefit resulting from restrictions which I have placed upon the use of water externally. The skin has a natural oily secretion which is necessary for its integrity, and when this is too constantly removed its structure suffers. This is especially true when it is diseased: many and many a time have I found cutaneous lesions irritated and the disease kept up by washing. I know that this is contrary to what is stated by some others and in text-books, but as I have often remarked to you, I have also the authority of Hebra, who toward the end of his life wrote very strongly on the subject of the abuse of water.

I cannot close this simple and homely talk on some practical points in local treatment without reminding you again of the immense value of the solid rubber bandage in connection with affections of the lower extremities. I will not enlarge on this subject now, as I presented it so fully last year, but only remind you of the many cases in which some of you have seen it applied here during past years, and how easily and agreeably it takes the place of other local treatment, during the daytime, effecting that which no other measures can accomplish.

In conclusion I want to call your serious attention to the very wide field in medical thought which may be embraced under the head of Dermatology. Diseases on the skin may be the sign of systemic infection, as in the case of the *exanthemata, syphilis, leprosy,* etc. Again, they may be the sign of active autoinfection, as in *urticaria,* severe *erythema multiforme,* and some others; with lesser disturbance of the metabolic processes of the system we have such affections as *eczema, acne,* probably *psoriasis,* and many

of the congestive eruptions; then, as I showed in my lectures two years ago, we have many, and often intimate, connections between certain cutaneous affections and disorders of the nervous system, circulatory system, sexual system, etc. All these considerations justify the remark I have often made, that to be a good dermatologist one must be a good, all-around physician, ever on the alert to recognize and properly care for the systemic derangements which are so commonly at the bottom of many skin affections.

When we consider local treatment, one sees that there is necessity of being equally alert and observing, quick to recognize and judge of the requirements of the case, and ready to adapt surgical principles to the condition present. In a word, to properly treat diseases of the skin one must be careful and accurate in observation and analysis in order to make an accurate diagnosis, and thoughtful and resourceful in order to recognize and meet the possible requirements in internal and local treatment. All this is quite different from the hasty and careless way in which cutaneous disorders are occasionally dismissed with Fowler's solution and the local application most recently presented in medical literature or by advertisement.

531 MADISON AVENUE.

THE THERAPEUTICS OF MINERAL WATERS OF THE FRENCH LICK TYPE IN GASTROINTESTINAL DISEASES.

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The efficacy of crounotherapy in the treatment of gastrointestinal diseases needs no emphasis. With the results that have been obtained, both clinical and experimental, at various European resorts you are already familiar, but reliable data of like character regarding our own waters is not always at hand, and it is this fact which has prompted me to submit a résumé of observations made during my year's residence at French Lick Springs.

Three years ago I presented to the American Gastroenterological Association a report of one hundred cases treated at this same resort. Further experience has served both to confirm and to modify the opinions then expressed, so that this may be considered, in a sense, a supplemental report. I shall not take up space with details of individual cases; I wish merely to indicate the nature of the conditions which are referred to French Lick Springs for treatment, and to point out those in which experience has seemed to demonstrate the utility of these waters.

As regards the general character of the French Lick waters, I may say that they belong to that large and very artificial class commonly called sulphur, but as this includes waters of such widely differing chemical constitution and physiological action, a better conception of their nature is afforded by the designation sulpho-saline-alkaline, or, following the German classification, alkaline-saline. They contain on an average a total of approximately 350 grains of solids to the gallon, and owe their therapeutic value to the presence of the sulphates of sodium, magnesium, and calcium, the chloride of sodium, and the carbonate of magnesium and iron, all of which substances exist in sufficient quantity to produce their characteristic physiological effect. They are derived from three different springs, known respectively as Pluto, Proserpine, and Bowles, all having a uniform temperature of 55° F., but differing considerably in the proportion of their constituent elements.

Pluto spring, the strongest of the three, resembles in many respects the waters of

Carlsbad. It differs both in temperature and in the presence of sulphuretted hydrogen, and also in the fact that the sulphates instead of being practically entirely of sodium have as their bases magnesium, sodium, and calcium in the proportion of approximately 24, 48, and 120 grains to the gallon, respectively. The salines exist in somewhat larger proportion than in the Carlsbad waters, the alkalines in less. The following comparative analyses show their similarity:

	Parts per 1000.				
	Sulphates: sod., mag., calc.	Chlorides: soda.	Carbonates: sod., magnes.	Total solids.	Analysis by
French Lick (Pluto)	2.73	1.99	.56	5.28	Coll. Med. Lab.
Carlsbad (Sprudel)	2.59	1.04	1.80	5.43	Ludwig.

Proserpine spring is of much the same character, except that it is milder. In the Bowles spring the sulphates consist largely of lime salts, sodium and magnesium being present in but small quantities, the chlorides, carbonates, and iron all being increased. It is laxative to a very slight degree and acts chiefly as an antacid, diuretic, and tonic.

The conditions in which such waters might be successfully employed will suggest themselves, and will be still further indicated by the following brief recapitulation of cases treated:

My clinical record shows a total of 2318 cases, of which number 970 have been diseases of the stomach and intestines, although a very large proportion of those included under other classifications have shown evidences of a disturbed digestion. They have been classified, however, according to what appeared to be their principal pathological feature, and hence were not, strictly speaking, diseases of the gastrointestinal tract.

One hundred and thirty-nine have been diseases of the liver and gall-bladder, mainly hepatic congestion, cirrhosis, cholelithiasis, cholecystitis, and cholangitis, in practically all of which digestive symptoms were associated.

The same may be said of the constitutional disorders, of which there were 326, embracing 97 cases of gout, 84 of diabetes, 78 of obesity, and 66 of rheumatism.

One hundred and twenty-six were diseases of the genito-urinary tract, of which nephritis, nephrolithiasis, cystitis, and prostatitis have been the most frequent; 132 were cutaneous diseases, principally eczema, acne, and urticaria; 331 were functional disturbances of the nervous system, generally of a mild type, in which the chief manifestations were general nervous depression associated with disturbances of digestion, malnutrition, and autointoxication. In many of these, as well as in other conditions, the disturbances of digestion involved both the stomach and intestines, but such symptoms were of secondary importance to other phenomena present.

Eighty-nine cases were of alcohol or various drug habits. Of the 340 cases remaining a considerable number came merely for rest and change and presented no definite pathological state. Others were convalescent from acute infectious diseases or had conditions in which the waters had no particular indication. In not a few instances, of course, more than one condition was present. As a rule the diagnosis was based upon the physical examination and laboratory findings in addition to the clinical history, and particularly has this been the case in digestive disorders. The latter I have subdivided as follows:

Diseases of the Stomach:		Diseases of the Intestines:	
Gastric carcinoma	5	Carcinoma	2
Gastric ulcer	11	Ulcer	4
Gastritis	151	Enteritis	81
Achylia gastrica	26	Colitis	140
Hyperchlorhydria	108	Appendicitis	21
Gastric neuroses	71	Proctitis	8
Gastrectasia and gastroptosis	49	Enteroptosis	56
	421	Intestinal neuroses	76
		Constipation, atonic and spastic	139
		Hemorrhoids	22
			549

I have not attempted a further tabulation by indicating results in individual cases, partly for the reason that in many the length of time during which they were

under treatment, usually from two to three weeks, was too short to admit of definite conclusions, but I have made it a rule to see patients just prior to their departure and record the progress made. In quite a few I have kept advised as to their subsequent history by correspondence and by observations made during three or four successive visits, so that the information at hand is sufficient, I believe, to justify an opinion as to the general results obtained. These I would summarize as follows:

Among gastric disorders, chronic gastritis, whether associated with subacidity or with increased secretion, was almost uniformly benefited, improvement being noticeable very soon after beginning the treatment. The results in cases in which the abuse of alcohol and luxurious habits of living were the chief causative factors were particularly good, and especially was this the case if coupled with the gastric catarrh there were evidences of hepatic congestion, constipation, or gouty tendencies.

Equally favorable, although perhaps a little less constant, were the results obtained in cases of hyperchlorhydria, there being a gradual and frequently a quite rapid diminution in the secretion of hydrochloric acid, whereas in gastritis with hypoacidity this substance was increased. I confess to having entertained some doubt as to the possibility of obtaining results of such an opposite character by the use of the same remedy, and had I no other means of verifying this fact than by the statements of patients as to the disappearance of symptoms, my skepticism would not have been entirely dispelled, but when coincident with such subjective improvement I repeatedly found a restoration of normal acidity in cases in which former analyses had shown it to be absent or diminished, and in others markedly increased, the evidence was most convincing. Two things must be borne in mind, however, in this connection: one that the best results were obtained when the waters were used at different temperatures, and another, and what seems to me to be an important fact, that I have never been able to influence at will the secretion in subjects in whom the secretory function was normal, the results, in practically every instance in which such experiments were made, and in which a considerable quantity of the water was administered, being a diminution of the secretions. This I have observed not only in persons who have volunteered to have such demonstrations made, but in those who were drinking the water for some other purpose and in whom there was apparently a normal gastric function.

These observations are in accord also with the results reported by Von Noorden in experiments made with the waters of Homburg. His conclusions are that "one and the same method of balneological treatment acts curatively in different diseases of the stomach, and while in healthy subjects the effect may be exerted in but one direction, viz., toward decreasing the hydrochloric acid secretion, when the stomach is sick there are apparently certain factors which become operative which are altogether independent of this secretion."

In the few cases of peptic ulcer which I have had under my care the results have been very satisfactory, but I would not venture an opinion as to their permanency. In only two cases were there evidences of retention from organic obstruction.

A few of the cases of gastrectasia showed no improvement, in others the improvement was quite marked, the difference being in large measure due to the presence or absence of obstructive lesions. Whenever possible such cases were treated by gastric lavage, using the mineral waters for this purpose, and very little of the water was drunk.

As regards the results in the gastric neuroses, they were variable. In those in whom the disturbance of digestion was primary, they were almost invariably good. When the digestive symptoms developed secondarily they were less certain, although some improvement was generally manifested.

Catarrhal conditions of the intestinal tract were, as a rule, much benefited, and in many cases the results were of a brilliant character.

If diarrhea was present only very small quantities of the waters were used, and with but few exceptions the character and frequency of the stools showed early improvement. Whenever constipation was associated it responded very promptly to the treatment. Much of the benefit shown in these cases was attributable, I believe, to the use of the waters locally by colonic lavage, and it seems to me the advantages to be gained by this method of employing waters of this class are too little appreciated.

Cases of habitual constipation due to simple muscular atony were nearly always relieved temporarily, but to obtain permanent results it was necessary, in most instances, to supplement the drinking of the waters with such accessory measures as are usually found beneficial in such cases. When treated in this way the results were excellent, and many of the cases were of an obstinate character.

The treatment has been by no means limited to the administration of the waters alone, although practically it has been without other forms of medication. The total quantity of water prescribed has varied from 300 to 2000 cubic centimeters daily, taken during one, two, or three drinking periods. In some cases the waters have been used hot exclusively, in others at their natural temperature, and those of the different springs have been used according to their particular indications.

As regards diet, it has been our custom to prescribe almost wholly with a view to the condition present with but little regard to the waters except as to volume, and thus far we have had no occasion to regret having pursued this course, notwithstanding the many traditions to the contrary. The only instances in which we have seen acute indigestion as a result of dietetic influences have been those in which alcohol, or considerable quantities of acids, have been taken while drinking the waters, or in which the dietetic regimen has for other reasons been obviously unsuited to the condition present.

A great tendency among many of our own countrymen in visiting resorts of this character is to overdo everything. They want quick results, and with this object in view are inclined to drink too freely of the waters and to tire themselves out with excessive exercise, but such proclivities are, I am pleased to say, showing an encouraging abatement, and there is an increasing recognition of the fact that in balneotherapy, as in all other forms of treatment, an exact diagnosis and attention to detail both as regards the chemical constitution of the water and the manner of its administration are essential to the best results.

Possibly it may appear to some that the opinions here expressed are based more upon superstition and tradition than upon scientifically established facts. I have not, it is true, given any satisfactory explanation of the particular physiological processes which serve to bring about such results, nor can I, I freely concede, offer any rational therapeutic hypothesis based entirely upon the chemical analysis of the waters, but the evidence adduced from clinical observations is such as cannot be successfully controverted by theoretical reasoning alone. It is generally admitted, I think, that even minimal quantities of mineral substances existing in natural waters may produce effects for which no analogy can be found in similar synthetic compounds, and hence we cannot regard them as of negligible influence even though we may fail to comprehend the manner of their action.

What has been said regarding the French Lick waters applies also to other alkaline-saline waters of the same type. I have spoken particularly of these waters because of my greater familiarity with their use, and while I do not wish to minimize the effects of change of environment, rest, diet, and other accessory measures used in the treatment of the cases here referred to, I am confident that much of the good results observed have been attributable to the specific influences of the waters themselves.

A PRIMER ON THE ADMINISTRATION OF ETHER.

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There are few in the medical profession excepting surgeons and those experienced in anesthetizing with ether who realize its seriousness and the importance of its proper, careful, and scientific administration. Even among surgeons who would not think of allowing a trained assistant to tie a ligature or to sew up a wound for them, there are those who will often, and without the slightest compunction, entrust the administration of the anesthetic to a student, nurse, or inexperienced anesthetist. Only too common among general practitioners is the custom, in the course of a difficult confinement, of leaving the administration of the anesthetic to the nurse (often not even trained), and of guiding directions as to when to add more ether by the amount of outcry or resistance the patient makes. Fortunately, however, this practice appears to be gradually giving way to the sane policy of calling in a brother practitioner in such emergencies. Because of the recognition of the above facts, and because one so frequently sees ether given improperly, it occurred to me to call attention to some of the mistakes and pitfalls into which a beginner is likely to fall, and to point out some of the remedies which I have personally found of use in a rather large number of cases.

In presenting this brief paper, I wish to touch especially upon some of the small, almost insignificant details which tend toward the better results in the administration of ether, and to leave the larger aspect of the action of ether, its general effects upon the economy, the selection of the anesthetic, etc., to more exhaustive treatises upon the subject. I wish to call attention to the practical things which to many may seem superfluous, but which, nevertheless, contribute the little mites which go to make up the successful anesthetist. In a purely practical subject of this character the more commonplace and well known the fact, the more reason for its reiteration. If any apology is needed I believe it should be for the minutiæ accidentally forgotten.

To begin with, use only freshly opened cans of ether and always have about twice as much on hand as you expect to use, obtaining it in small cans so that those not used can be returned. By no means suffer from the delusion that because you have apparently corked the can you used last week it would be a waste of money to throw it away and use a fresh can. I believe it will be found to be the experience of all that it takes longer to place the patient under the influence of the anesthetic without mitigating any of the disagreeable features of the process, and that it is almost impossible to keep a patient under old ether after she has been once anesthetized. It is better economy to throw the ether away, or keep it to take out spots from your clothing and remove adhesive plaster, than to waste time using it for an anesthetic.

Be sure to have plenty of gauze to use as an inhaler, for mouth swabs, etc. Always carry a tongue forceps, mouth-gag, and swab holder. It is also advisable to have a hypodermoclysis needle, veneclysis cannula, and an emergency pocket case as well. There may not be one case in a hundred in which these may be needed, but when you encounter that case they are indispensable. See that your hypodermic syringe is in working order and that your vials are not empty. Last, but not least, get a number of towels or clean cloths close at hand, for they will probably come in handy before the patient is again *compos mentis*.

Should you be a stranger to the patient, if possible become acquainted with her for a few minutes before the administration of the anesthetic, and be sure to learn her name. Be natural and try to decrease the seriousness of your duty, even, if necessary, at the expense of some of your own

importance. Make no display of the few instruments you may need, but keep them from the patient's view as far as possible. The more favorable the impression you make upon the patient and the more confidence you manage to inspire before you commence your labors, the less difficulty you will encounter in controlling her during the first stages of ether, and consequently, the less the nervous shock to the patient. Incidentally note the character and rate of the pulse and make a brief but careful examination of the heart and lungs, being sure to reassure the patient that it is merely a matter of routine and really unnecessary in her case. Of course, all false teeth, chewing gum, or other extraneous articles, must be removed from the mouth before commencing, and the patient's urine, etc., should have been investigated before you are called in to anesthetize.

Having gone through all the preliminary steps and having been given the word to proceed, take a towel and cover the patient's hair and eyes, assuring her that you are not trying to conceal anything from her, but are merely doing it to keep the irritating ether from getting into her eyes. Then take about twelve thicknesses of gauze large enough to extend from the eyes to the bottom of the chin and to cover both cheeks, and, beginning at some distance from the face to acquaint the patient with the peculiar odor, drop the ether on the gauze slowly, drop by drop, gradually lowering it until it is resting over the face and completely covering the nose and mouth. Instruct the patient to breathe naturally as if falling to sleep, and assure her that while she may notice a slight choking sensation she should not mind it, as you are watching her carefully and will not allow any accidents to occur. Under no condition allow any one to try to restrain her until you have exhausted every possible means of persuasion, and, as far as possible, have no talking in the room to distract the patient's attention from your own directions.

It may appear odd that I have gone into such minute detail even as to what should be told to the patient, etc., but I have felt it necessary because of the frequency with which I have seen men come in upon a patient, soak an ether cone with ether, place it over the face and say, "Take deep breaths, please," at the same time asking the nearest person to hold the patient while the anesthetist proceeds to chat with some nurse or friend who happens to be at hand. This is all wrong and does more to shock the nervous system of the patient than does the anesthetic itself. In the first place, the patient not having had an opportunity of becoming acquainted with one to whom she feels she is entrusting her life, naturally lacks confidence in him and feels that she must fight her battles alone. While still in this frame of mind she becomes more firmly convinced of it by seeing a large mask thrown over her face, followed immediately by a choking sensation. She is stricken with terror and naturally attempts to resist, the ever-ready assistant immediately pinning her down to the bed, while the "ogre" at the head proceeds to complete the choking act.

This is no idle picture, for I doubt if there is any man who has not heard the tales of horror told by those who have been compelled to take ether. The shock tends to make patients nervous, and to those of naturally neurotic temperament may cause considerable damage. In 95 per cent of the cases it is unnecessary and avoidable simply by putting the patient in the proper frame of mind before commencing the anesthetic, assuring her of your care, etc., while she is still conscious, and by taking things slowly in the beginning. When the patient has become accustomed by degrees to the odor of the ether, then you may instruct her to take deep breaths, or, preferably, "to blow all the ether out of the lungs," which will naturally be accompanied by the desired deep inspiration. Any attempt at resistance can almost always be controlled by instructions from the anesthetist, addressing the patient by name, and it is very rarely indeed that it is necessary or even desirable to have any one restrain her.

During the stage of excitation the patient very frequently ceases breathing and begins to become cyanotic. We are often told that since this is due to the irritation of the

ether, the only thing to do is to take no notice of it, but to push the ether all the harder and the patient will again begin to breathe. I do not agree with this method of procedure. While it is true that in the majority of cases it will succeed, I believe that the rise in blood-pressure during this period of apnea, in addition to the surcharging of the blood with carbon dioxide, cannot help but result in injury to those with stiffened arteries or a tendency to unstable circulation. I prefer always to remove the gauze, open the mouth, or rub the lips as a means of external irritation, thereby inducing respiration and again filling the patient's lungs with pure oxygen and the circulation with good red blood, before proceeding with the anesthetizing. It may take a few seconds longer, but the results will be better in the long run.

Having pushed the ether until the patient is apparently under its influence, the anesthetist naturally begins to make his tests. This can be done in various ways, but I believe the best way to determine if the patient is sufficiently anesthetized is by raising an arm and determining whether it is still rigid or not. I do not believe in using the eyes as a test at this stage of the anesthetization, for if the patient is resting quietly, but still not yet completely under the influence of the ether, it is much more liable to stir up resistance than is the other method.

Having found the patient to be relaxed, the gauze may be removed from the eyes and an effort made to see if the patient resists the opening of the eyelids, or if the eyes still twitch as is noticed in nystagmus. *Never* touch the conjunctiva to determine if the patient is under the influence of the ether, as it is entirely unnecessary and is liable to give the patient conjunctivitis. I cannot insist upon this too strongly, as it is one of the most frequent, thoughtless errors made in the administration of ether.

Having at last found that the patient is completely under the influence of the ether, she is now prepared for operation, care being taken to see that the patient's arms are not hanging over the edge of the table, causing pressure on the musculospiral or ulnar nerves. I have seen one case of musculospiral paralysis and several of paresis from this cause. The anesthetist, with his hand under the patient's chin to keep the tongue forward, should settle himself comfortably, prepared to administer the anesthetic for an indefinite period with as little inconvenience as possible. I believe I say "comfortably" advisedly, for any human being (even a physician) who is compelled to remain in some cramped or straining position for one or two hours is liable to think a little too much about his own discomforts and too little about the patient.

As a rule, from this stage of the operation there is but little difficulty. Ether should be dropped, not poured, on the gauze, which may now be made thicker so as to retain it longer; or some form of inhaler may be used. The pulse, which may have risen somewhat during the stage of excitation, now gradually settles to normal or even lower than when the patient was first seen. The breathing is regular and quiet or snoring. The pupils are in a state of activity, being dilated when the eyes are closed and immediately contracted when exposed to light. The color of the lips is a natural red and the nails pink.

The above is the normal state of a patient under ether narcosis, and when the patient is in this condition it requires very little ether to keep her there, and, therefore, as little as possible should be administered. Should you be too sparing, you can easily discover it in a number of ways. Probably the first thing to be discovered will be a twitching of the eyeballs and contraction of the pupils. Then the patient will interrupt the deep natural breathing with a heavy sigh. This is a positive sign that more ether is needed, and if not heeded rigidity will soon set in, interfering with the workings of the operator.

This form of error is readily corrected, and is the safer side on which to err. The other form of error is where too much ether is administered. This, too, has its definite signs, and they must always be carefully looked for and rapidly heeded. The most commonly recognized one is failure of the pupilary reaction. The pupil, normally

dilated with the eyes closed, fails to contract when the lid is retracted. This is a warning to be immediately followed by the removal of the inhaler until the reaction is regained. Usually nothing more will be required in the way of treatment.

In other cases the patient suddenly ceases breathing, the lips become cyanosed, and she appears to be in imminent danger of asphyxiation. This will usually yield to throwing forward of the jaw by grasping it behind the ramus on both sides with the fingers, while the thumbs are placed upon the chin and pressed downward. As a rule this throws forward the tongue also, or it may be grasped by a tongue forceps and brought forward. Should this not induce respiration, moderate rhythmic traction can be made upon the tongue, eighteen per minute, while some one else makes pressure upon the chest. *Too much traction should not be exerted upon the tongue,* for Crile has shown experimentally that this in itself is sufficient to cause a cessation of respiration with fall of blood-pressure, etc. The pouring of ether upon the chest may be tried, but it is of doubtful value during profound anesthetization. The Marshall method of artificial respiration may be used, but is not as effectual during profound narcosis as in other states because of the great relaxation of all the muscles. As a last resort, forced, direct artificial respiration may have to be tried, although I have never seen a case in which this was necessary.

Another warning sign, more insidious in onset but harder to overcome, is the gradual failing of the pulse, which becomes more rapid, of smaller volume, and accompanied by greatly decreased blood-pressure. This is seen in some cases in which there has been practically no loss of blood, and is usually the result of shock of the operation. It is, however, a warning to the anesthetist to reduce his ether to a minimum. The patient's general condition is in his hands, and he must assume full charge of the precautions to ward off the impending shock, whether from profuse hemorrhage or from prolonged manipulation of the viscera, etc.

In cases in which the shock is not due to hemorrhage, in the earliest stages, the condition can at times be met by the hypodermic administration of camphor gr. 1 in oil, digitalis 15 minims, or 15 minims of adrenalin chloride.[1] This method of using adrenalin chloride is not very satisfactory because the local contraction of the blood-vessels prevents the absorption of the adrenalin and permits its rapid oxidation by the tissues. A more satisfactory method will follow.

Unless the circulatory failure is distinctly due to cardiac disease and not to vasomotor exhaustion, as is usually the case, strychnine should be avoided, for in shock, as shown by Crile, strychnine rather aggravates than alleviates the condition.

Should the skin be leaking badly, the administration of atropine sulphate gr. 1/100 will assist materially. Nitroglycerin is contraindicated in shock.

In some cases all of these things appear to be insufficient and the patient is sinking rapidly. At this juncture nothing will tend to revive her as speedily as the slow, continuous intravenous introduction of about 500 cubic centimeters of normal saline solution with adrenalin chloride, 15 minims, to be followed immediately by the subcutaneous introduction of one to two thousand cubic centimeters of salt solution. With the exception of cases in which the shock is due to the loss of blood and the vascular system is greatly depleted, I do not believe in introducing large quantities of salt solution intravenously at one time, for the circulation already contains its full quota of blood which the heart is not able to care for, so that I think it poor logic to throw in a large extra quantity of fluid upon it until it has had a chance to recuperate to a certain extent. The smaller amount of salt solution will stimulate it sufficiently for the time being, and then there will be a gradual but constant stimulation to be derived from the saline solution introduced subcutaneously.

In cases of profuse hemorrhage, in addi-

[1] Adrenalin chloride is now placed on the market in the form of tablets, which when dissolved in fifteen minims of water make that quantity of a 1-to-1000 solution. This is a very convenient form in which to carry this important article of the anesthetist's outfit.

tion to lowering the head of the patient, I follow out the same rule, but instead of introducing 500 cubic centimeters of normal saline solution with adrenalin chloride, 1000 or 1500 cubic centimeters are slowly introduced intravenously.

As to the technique of these operations, for the intravenous introduction of the salt solution, I use the median basilic vein and follow the usual procedure. I would warn against one thing, however, as the result of unfortunate experience, and that is never to try to cut the vein with a knife, for the chances are that a ragged cut or tear will be made which will be difficult to find when an attempt is made to introduce the cannula. Always use a scissors, making a clean cut in a transverse direction; and the entire operation can be completed, ready to introduce the solution, within two or three minutes. There are some who are skilful enough to introduce a fair-sized hypodermoclysis needle directly into the vein without incision, but in the very few trials that I have made I have never succeeded in doing more than to distend the proposed field of operation with so much fluid which was intended to enter the vein, but did not, that I was compelled to go to the other arm or to the leg to perform the open operation satisfactorily. For the hypodermoclysis, I usually use the breasts, being sure to lift them up first, and then to introduce the needle parallel with the thorax, beneath the breasts, and not into them. When there is difficulty in getting the fluid to run, it usually lies in the fact that the point of the needle is in the breast proper or in the skin and not in the loose connective tissue under the breast. The thigh also may be used.

There can be no question that the most efficient method for combating shock and raising the blood-pressure is the pneumatic suit of Crile, but this is unfortunately rarely at hand when most needed, so that we are compelled to depend upon simpler means in most cases. Bandaging of limbs tightly from the extremities upward will in some degree answer the same purpose. Hot-water bottles and hot blankets should be placed all around the patient, and every portion of the body but the operative field should be kept covered and dry.

I believe that sufficient has been said to bear out the following statement, namely: that the anesthetist will have enough to do to attend to his own business and watch his part of his obligation without expending his energies in trying to follow the dexterous moves of his colleagues, the operators. His duty lies at the head of the patient, and the patient is entitled to his most careful and constant attention, for it frequently lies in his power to stave off some danger which another moment would make too late. He also owes this to the surgeon, for the men who pay too much attention to the operation are usually awakened by the patient suddenly beginning to vomit and retch, which naturally brings everything to a standstill; or the patient will unexpectedly begin to groan or become rigid, and some minutes are lost in the midst of the operation in obtaining complete relaxation. These statements are not vague fancies, but actual facts seen time and again.

The operation having been completed and the patient having been returned to bed in fairly good condition, it is not usually safe for the anesthetist to leave her in the care of one untrained until he is sure of her ability to swallow and until she is at least semiconscious, for fear of vomiting, which may be aspirated and lead to aspiration pneumonia or asphyxia. Many things have been suggested for the prevention of vomiting after ether, such as the inhalation of vinegar, aromatic spirits of ammonia, oxygen, etc., but to my mind the best results are obtained by the careful preparation before the operation and the washing of the patient's stomach while still on the table and under the influence of the anesthetic.

The after-treatment of the patient will depend much upon the operator, the nature of the operation, and the condition in which the patient withstood it. When the anesthetist has returned his patient to her bed and left her in a conscious state or turned her over to the surgeon in charge, his obligation is over.

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THYROID EXTRACT IN MIGRAINE AND EPILEPSY APROPOS OF TEN CASES.[1]

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The value of internal secretions of various glands of the organism is so well established now that further comment on their importance is unnecessary. The thyroid gland in particular in its relation to various metabolic processes has made its history. We are all familiar with the effect of thyroid extract in delayed union of fractured bones, rickets, hemophilia, obesity, infantilism, myxedema.

Some functional nervous and mental diseases, depending upon the presence in the organism of toxic products elaborated in some way, curiously enough improve under the administration of thyroid extract. It is therefore supposed that there is a relationship between the toxic elements found in the body and the thyroid gland.

Migraine, which is due to a morbid metabolism, has an undoubted relationship to a faulty thyroid function. In pregnancy, for example, there is a functional hyperactivity of the thyroid gland, and migrainic patients are practically free from attacks of migraine during that time. One may say that there is an auto-cure with thyroid gland. In myxedema the headache as well as the physical and the intellectual debility are due to absence of thyroid function. Migrainic individuals usually suffer from general lassitude, anorexia, articular pains, constipation, obesity, falling of hair. All these symptoms are also observed in cases with diminished thyroid function.

The autointoxication in migraine is of course not always directly due to a disturbed function of the thyroid gland. It may originate from other sources. There is nevertheless a series of cases which are so to speak "thyroid" in nature, and in which the administration of the extract of this ductless gland gives satisfactory results. The therapeutic test therefore is at the same time pathogenic.

That there is a relation of the seizures of essential epilepsy to a faulty chemistry of the organism is now a definitely accepted view. The physiological data concerning the metabolism immediately before and after the attacks, and in the intervals free from convulsions, and our practical experience with the cases in which neglect in the alimentary régime and in proper elimination is invariably followed by increase in the number and intensity of epileptic seizures, are all corroborative of the above view.

Last year I reported before this society my very satisfactory experience with the removal of salt from the diet of epileptics. My clinical observations were confirmatory of the facts of physiological chemistry, viz., that an exaggerated elimination of the products of metabolism follows dechlorization of epileptic individuals. It is therefore evident that deviation from the normal chemical processes in the organism originating from any cause plays an important etiological part in epilepsy.

The disturbances occurring in the function of the ductless glands produce a perturbation in the entire organism. Myxedema and acromegaly are striking illustrations. Individuals suffering from epilepsy, and at the same time presenting deficient thyroid glands, have sufficient reason to account for their seizures. The six epileptic patients whom I studied with especial care, and who have been under my treatment for a long time, all showed signs of hypothyroidization. The extreme care in selection of their diet, in regulation of their mode of living, the avoidance of stimulants, intoxicants, and finally the bromide treatment, have all proved to be only of very little benefit. When the thyroid treatment was instituted, a remarkable change took place first in the general condition of my patients. The apathy, lassitude, and headache have all gradually disappeared, and the gastrointestinal digestion has improved. The epileptic seizures became less and less frequent, so

[1]Read before the Pennsylvania State Medical Society, September, 1907.

that at present, I may say, they are rare. I call your special attention to Case VIII, who has had no recurrence for four years, although her epilepsy had lasted sixteen years. Of course this is extremely exceptional. The other cases of my series have an attack once in several months, while prior to the thyroid treatment the seizures occurred once a week in spite of the bromides, dechlorization, and special dietary régime. Such results, I may say, are almost identical to those obtained in laboratory experiments. A conclusion forces itself upon us, viz., that idiopathic epilepsy is always associated with defective metabolic processes. The latter may originate from many sources. There is a certain class of epileptics whose seizures are in direct relationship with a disturbed function of the ductless glands, and particularly the thyroid. In such cases the reason of failure of the usual treatment lies in the want of thyroid feeding. Administration of the latter will be of great benefit.

I was anxious to bring forward the results of my accurate observations in a few selected cases of migraine and epilepsy studied with the utmost care as to the comparative effects of the ordinary treatment and of thyroid administration. The therapeutic armamentarium in neurology is very limited, and if careful and prolonged observation leads to reasonable deductions in this difficult and as yet obscure field of medical science, a trial of insufficiently explored medications should be welcomed and repeated in the interest of the unfortunate victims of apparently incurable nervous diseases. In my hands thyroid medication has yielded satisfactory results in cases with deficient thyroid function. I submit my experience to you for further observation.

The following is a brief account of the ten histories of my patients:

CASE I.—A. G., unmarried woman of thirty-nine, has had migrainic attacks since the age of twenty. She is obese and suffers from constipation. The attacks of headache are very severe, last from a few hours to two days, and are particularly marked about the menstrual periods. A special diet free from nitrogeneous food, avoidance of stimulants, also of tea and coffee, saline purgatives twice a week, hydrotherapy, outdoor exercises, have succeeded in reducing the intensity of the attacks. Various medications—stomachic and sedative—have also been used, but very moderately. Finally I had recourse to thyroid medication. The latter had the most beneficial effect. The severity of the attacks and also their frequency have considerably diminished, and now only exceptionally an attack occurs. It is the fifth month and no recurrence has taken place.

CASE II.—B. Mc., a girl of twenty-one, has had peculiar attacks of migraine, resembling epilepsy in some of its features. Since the age of eight years, suddenly, without warning, everything before her eyes becomes dark and cloudy, and an intense vertigo sets in. She is compelled to lie down and close her eyes, for as soon as she opens them the vertigo becomes intolerable. There is no loss of consciousness or convulsions. An attack lasts from half an hour to three hours. She is unusually obese, with a very pale skin. Her memory is very poor and she complains of constant fatigue. Her menstruation is very painful. A treatment similar to that of Case I only ameliorated the condition. Thyroid extract administered instead of the usual medications gave the most satisfactory results. Prior to this treatment an attack occurred almost every other day, and sometimes two or three times a day, but since the treatment only once in several weeks. The improvement began on the tenth day of the administration of the thyroid. It is now the third month and there has been no recurrence of migraine.

CASE III.—A. C., a man of forty-nine, whose parents were migrainic, has had attacks of hemicrania almost every month from the age of twenty-nine. The patient's mentality was below the average. Physically he was weak, complaining continuously of inability to walk a few squares without getting fatigued. The usual treatment as outlined in Case I gave him only some relief. Thyroid medication increased the intervals between the individual attacks, so that at

present he has been free from them for a period of six months. The attacks of rheumatism from which he suffered besides the migraine have not recurred, and his general health is very good.

CASE IV.—M. I., woman of fifty-seven, obese, has had typical attacks of migraine during the last twenty-five years. Her thyroid gland is somewhat enlarged. The usual treatment gave only partial relief, but the most remarkable results have been obtained by me from thyroid extract. Formerly the attacks occurred every month or three weeks, now the interval is considerably greater. During the last four months there has been only one attack.

CASE V.—K. S., a boy of seventeen, has been suffering from epilepsy (grand mal) since the age of six. He also presents evidences of arrested mental development. The thyroid gland was not palpable. Removal of meats from his diet, of tea and coffee, also of table salt—in addition to the usual bromide treatment in increasing doses—has considerably improved the patient's condition. The frequency and intensity of the nocturnal attacks diminished at first, but then remained stationary; they occurred every third week instead of every third day. When an unusual acne would compel me to discontinue the bromides, the attacks would become more frequent. Thyroid extract was then substituted for the bromides in doses of two grains every third hour. Amelioration of the condition began on the twelfth day. The intervals between the attacks gradually increased, so that now in the ninth month of the thyroid treatment he had only three attacks. The boy became considerably brighter.

CASE VI.—L. Y., a man of forty-three, without a specific history, has had epilepsy since the age of twenty-three. His facies was that of a much younger individual. He suffered considerably from headache, was apathetic, indifferent. At times his lassitude would become extreme. The appropriate dietetic régime, and bromides, succeeded somewhat in improving his condition. When the thyroid treatment was instituted, amelioration of the general condition commenced very soon (on the tenth day) and continued increasingly. The seizures became more and more rare. At present the patient is much brighter, cheerful, and energetic. The last attack occurred five months ago.

CASE VII.—M. F., a boy of thirteen, has had epilepsy for the last five years. His general appearance suggests myxedema, but it is in no way typical. The facies is somewhat puffy, the skin is pale. The boy is languid, complains of headache. The thyroid gland cannot be palpated. The usual treatment with bromides gave some relief, but thyroid extract gave the most satisfactory results. The epileptic seizures became very rare. At present the boy has been free from them for four months. The mental and physical conditions improved greatly.

CASE VIII.—I. M., a woman of fifty-seven, obese, rheumatic, has been suffering from epileptic convulsions for sixteen years. She had the ordinary treatment, especially bromides. There was some improvement, but a marked diminution in the number of attacks and in their severity began from the time I put her on the thyroid extract. This case is one of the most remarkable I had under my care, as it is now the fourth year and the patient has had no recurrence of the attacks. She also lost considerably in weight and now feels well.

CASE IX.—W. G., a man of thirty-four, has had attacks of epilepsy since the age of seventeen. His general appearance is that of a lazy and sluggish individual. He suffers considerably from headache. He is obese, and his thyroid gland is somewhat enlarged. Bromide treatment and an appropriate diet improved the condition. Thyroid extract gave still better results. The seizures are very rare, once in five or six months. The headache has disappeared and he is much brighter than heretofore.

CASE X.—M. J., a girl of eight, had epilepsy since the age of five. She was extremely pale, very sluggish, apathetic. Suffered also from headache and involuntary micturition. The usual treatment improved her condition very slightly. Thyroid extract gave very satisfactory results. She became brighter and the seizures became quite rare. Her last attack was three months ago.

OPHTHALMO-REACTION OF TUBERCULOSIS.[1]

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[From the Research Laboratory of Parke, Davis & Co.]

Wolff-Eisner[1] in discussing Pirquet's demonstration of his cutaneous tuberculin reaction before the Berlin Medical Society, May 15, 1907, mentioned the fact that when one drop of a 1:10 tuberculin solution was instilled into the eyes of tuberculous patients a pronounced reaction took place. Vallée,[2] working with horses and cattle, confirmed the work of Wolff-Eisner. The action in guinea-pigs, however, was obscure. A reaction was not obtained in any non-tuberculous animals. On account of the pain and general severity of the phenomena, he did not think it could be used as a diagnostic agent on human subjects or even in routine veterinary practice. It remained for Calmette[3] to overcome these objections and to make a preparation of tuberculin which could be used in the human eye without causing too severe a disturbance. This he accomplished by precipitating the tuberculin with alcohol, thus removing all impurities.

PREPARATION.

Calmette in his original article (*loc. cit.*) states only that he used a dry tuberculin precipitated with 95-per-cent alcohol. In my own work I have prepared the tuberculin by adding one volume of Koch's old tuberculin to two of 95-per-cent alcohol. The precipitate thus obtained is very sticky and difficult to handle. In order to overcome this the precipitate is dissolved in distilled water and again precipitated with 95-per-cent alcohol, washed rapidly with absolute alcohol and ether, and allowed to dry. The precipitate thus obtained, when rubbed in a mortar, is easy to handle, light-gray in color, and retains its strength indefinitely. Calmette recommends that the solution be freshly prepared; but the Pasteur Institute of Lille, of which Calmette is director, put out the tuberculin in both the dry form, to which water must be added, and in solution ready for use. The solution apparently does not deteriorate rapidly, as I have obtained reactions with both Calmette's and my own after some weeks' standing. Parke, Davis & Co. have prepared for me an ophthalmic disk containing 10 mg. of dry tuberculin which is to be dissolved in one cubic centimeter of sterile distilled water, and which I have found very convenient. The solution is well preserved in glass tubes, slightly larger than the ordinary vaccine tube, and contains enough for one or two persons. These can be readily sterilized, and when both ends are broken the solution will flow out slowly enough to measure the drop accurately. It has the added advantage of allowing only a small part of the solution to come in contact with the air.

REACTION.

In obtaining the reaction, one drop of a one-per-cent solution of the tuberculin is instilled into the eye. After from three to twenty-four hours, sometimes forty-eight, if the patient is tuberculous, there is experienced a feeling of slight discomfort, described by the patient "as though I had been crying." Coincident with this there begins a congestion of the palpebral and ocular conjunctiva which in a few hours becomes decidedly red. The caruncle is swollen, red, and covered with fibrinous exudate. As the reaction progresses, lacrimation takes place and a fibrinous exudate resembling pus collects in the lower conjunctival sac and at the inner canthus, the maximum being reached in from six to ten hours. The patients complain of a slight heat and a general uncomfortable feeling in the eye, but have no pain. In some cases there is a slight impairment of vision. The conjunctivitis begins to abate

[1]Accepted for publication Nov. 10, 1907.

in from eighteen to thirty-six hours, and completely disappears in three or four days. In no reported case has harm to the eye resulted. No rise in bodily temperature occurs. There appears to be no relationship between the severity of the disease and the reaction. Calmette has obtained a pronounced reaction in cases showing only slight involvement, and some of my most severe reactions have been in mild cases. The solution prepared by the Pasteur Institute of Lille gives an unnecessarily severe reaction. With the unused eye as a control, it is easy to appreciate even a slight increase in the redness, and a severe conjunctivitis is not necessary.

The solution prepared as above described gives only a moderate reaction and is much more comfortable for the patient. The reaction is given in cases which have active or latent tuberculosis, except in far-advanced cases, while some cases apparently healed have reacted positively.

Any disease of the eye itself is a contraindication to the employment of this method.

Sabrazès and Dupérié have proposed to record the reaction as O. R. (ophthalmoreaction) absent; no redness, O. R. weak; conjunctiva slightly reddened, O. R. medium; conjunctiva reddened, caruncle swollen, fibrinous exudate, and lacrimation, O. R. strong; other symptoms as above noted, with edema of the lids, pain, and photophobia. This method can be easily modified to suit the observer.

In his first article (*loc. cit.*) Calmette reports twenty-five cases, of which sixteen known to have pulmonary tuberculosis gave the reaction, and nine showing no signs of tuberculosis were negative. In a second communication Calmette[4] and his associates report observation on two hundred cases, among which were many varieties of both medical and surgical tuberculosis. All the clinically tuberculous gave a positive reaction. In some patients supposed to be non-tuberculous, who gave a positive reaction, further examination showed tuberculosis to be present. Comby[5] in one hundred and thirty-two cases obtained a reaction in sixty-two. Post-mortem examination in six showed latent tuberculosis, while of the seventy which did not react, post-mortem examination of four showed tuberculosis absent. Letulle,[6] Sicard and Descomps,[7] Grasette and Rimbaud,[8] Lemaire,[9] Sabrazès and Dupérié,[10] have all confirmed Calmette's conclusions. The very simplicity of this test makes it necessary that it should be used with caution in order not to unnecessarily alarm patients with latent or unsuspected tuberculosis who may give the reaction.

I have tried the reaction on the following cases:

1. Tuberculosis of the lungs; child: Tubercle bacilli in sputum. Has been treated with tuberculin T. R. according to Wright's method for three months. P., D. & Co.'s solution, as above described; reaction strong.

2. Tuberculous cervical adenitis and tenosynovitis of both wrists, confirmed by microscopical examination; adult: Has been treated with tuberculin T. R. according to Wright's method for eight months. P., D. & Co.'s solution; reaction medium.

3. Tuberculosis of the appendix, confirmed by operation and microscopical examination; adult: Reaction medium on two occasions, once with P., D. & Co.'s and once with my own solution.

4. Tuberculous cervical adenitis, confirmed by microscopical examination; adult: My own solution; reaction medium.

5. Tuberculosis of the lungs; adult: No bacilli found. Had one hemorrhage. Radiograph showed area in upper left lobe. My own solution; reaction medium.

6. Patient, adult; no family history of tuberculosis, and has not been in contact with tuberculous individuals. Has slight cough and has lost some weight, but gives no sputum; temperature normal. Calmette's solution gave a strong reaction, and subsequent examination showed retraction of upper left apex with prolonged expiration. Radiograph showed involvement of left apex.

7. Tuberculosis of the lungs, latent; adult: My own solution; reaction medium.

8. Typhoid fever. Widal and blood cultures positive. Three weeks previous to test had temperature ranging from 99° to 105°, and had lost some weight. In lower left lobe there was a small area in which there was present interrupted, jerky inspiration followed by slightly prolonged expiration, but no dulness. My own solution was employed. Reaction was absent. Temperature remained high, and three days later blood gave positive Widal and culture of typhoid bacilli.

9. Tuberculosis of left kidney. Tubercle bacilli in urine obtained by catheterization of left ureter, July 2, 1907. Since then has been receiving Vaughn's tubercle residue. P., D. & Co.'s solution; reaction absent.

10. Valvular heart disease, suspected tuberculous peritonitis. Ascites present; adult: Tuberculo-opsonic index, blood, four observations, .85 to 1.10; ascitic fluid 1.54. P., D. & Co.'s solution; reaction absent.

11. Suspected tuberculous peritonitis; adult: Tuberculo-opsonic index 1.10. Operation showed trouble due to adhesions. P., D. & Co.'s solution; reaction absent.

12. Chronic endocarditis; adult: Calmette's solution; reaction absent.

13. Chronic epididymitis; adult: Part of epididymis resected and abscess opened, April 30, 1907. Histological examination showed tuberculosis absent. P., D. & Co.'s solution; reaction absent.

14. Chronic osteomyelitis of upper end of femur, thirteen years' duration; adult: Calmette's solution; reaction absent.

15. Healed tuberculosis of left kidney; adult: Five years ago tubercle bacilli were present in urine. Since then has played football and made world's record in track athletics. My own solution; reaction absent.

16. Puerperal sepsis. P., D. & Co.'s solution; reaction absent.

17. Chronic cystitis. P., D. & Co.'s solution; reaction absent.

18. Healthy adult. Calmette's solution; no reaction.

19. Healthy adult. P., D. & Co.'s solution; reaction absent.

20. Healthy adult. My own solution; reaction absent.

I have to thank Drs. Ballin, Metcalf, McLean, and B. R. Shurly for their kindness in allowing me to study this reaction in their cases.

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THE TREATMENT OF INTESTINAL INDIGESTION.

In the *American Journal of the Medical Sciences* for November, 1907, EINHORN has an article dealing with this subject. In regard to the treatment of the cases he states that in complete intestinal dyspepsia we must put the patient on a liquid or semi-liquid diet and administer pancreatic extract and similar medicaments. In partial intestinal dyspepsia we can limit the amount of that variety of food for which the particular disturbance exists. He also states that Taka-Diastase in doses of 5 grains three times a day has been a valuable help in his experience in cases of amylaceous dyspepsia, as it seems to have removed the subjective symptoms.

EDITORIAL.

SOME FACTS AS TO ANESTHETICS.

Although there is no part of medicine or surgery which has been subjected to more incessant clinical and experimental study than "anesthetics" we have much to learn concerning them, and frequent and valuable contributions to our knowledge of the drugs which produce surgical anesthesia are continually appearing. During the present year a very large amount of useful clinical and experimental research has appeared, and widely separated investigators have, unknown to one another, worked along collateral lines and produced results which are largely confirmatory of those obtained by their colleagues.

In a series of lectures upon general surgical anesthesia delivered by Frederic W. Hewitt at the London Hospital in the early summer of 1907 we find a number of points emphasized which are of considerable value from the standpoint of the practical anesthetist. Thus, he points out that although nitrous oxide is the safest anesthetic for the vast majority of subjects its use may be fraught with considerable danger for certain patients, such as those who suffer from any obstruction of the upper respiratory passages, from inflammations of the throat, from thyroid enlargement, and allied conditions. He thinks that in the presence of such complications the safest and best anesthetic is the so-called "C. E. mixture," composed of two parts of chloroform and three parts of ether, a mixture which it is well known is popular with many surgeons in England, but is scarcely ever employed in America. In those cases in which the patient is at all dyspneic Hewitt advises the administration of chloroform with great caution, although he seems to think that it is better than ether, and he believes that in such cases ethyl chloride is contraindicated. On the other hand, ether should not be given to patients who are emphysematous, bronchitic, or phthisic. Hewitt takes occasion to assert that the "C. E. mixture" produces better results than any other anesthetic with which he is acquainted, although he admits that much has been said against anesthetic mixtures.

He warns us against the overanesthetization of patients, a condition which is often caused by the desire of the anesthetist to produce a state which is eminently satisfactory to the surgeon, with the result that unnecessarily large quantities of ether are given, so that the patient becomes saturated with this drug. While it is true that deep anesthetization prevents reflex movements, muscular rigidity, retching, and coughing, a heavy price is usually paid for these benefits by the development of pulmonary sequelæ and obstinate vomiting. Again, he warns us against putting patients who have been deeply anesthetized back to bed while they are still fully under the influence of the anesthetic, for while lying upon their backs with the dusky color and deep moist breathing they are prone to draw mucus into the deep respiratory passages, and unless carefully watched may also inhale materials which are brought up from the stomach, so producing a septic pneumonia. All patients who suffer from retching or vomiting while still under the influence of the anesthetic should be made to lie on one side.

Still another point which he emphasizes is the necessity of the anesthetist administering the drug in different quantities according to the immediate necessities of the patient at the moment. Thus, although the patient should be ordinarily kept in what may be termed the neutral border-land of anesthesia, there are times during operation when it may be well to push the anesthetic a little further with the object of preventing reflex influences at what might be called the "critical juncture" of the case. With this view held by many surgeons Hewitt differs. This critical juncture occurs in ab-

dominal cases just when the abdomen is being opened or just afterward; in cases of nephrectomy when the pedicle is being pulled down; in prostatectomy when the urethra is being torn through; and in hysterectomy when traction is at its height. While Hewitt recognizes the fact that pushing of the anesthetic at this time may diminish reflex influences, on the other hand he thinks the combination of shock from the anesthetic and shock from the operation may be even more dangerous to the patient, and therefore he urges that in many instances at such critical junctures the anesthesia, though deep, should not be profound.

In another lecture delivered at the same institution Hewitt tells us that circulatory shock has happened in his experience most frequently in operations upon the abdomen, the kidney, and upon the breast. Thus, in 71 cases of circulatory shock, 26 occurred during intra-abdominal operations, 12 during breast operations, 10 during renal operations, 6 during rectal operations, and one during a tongue operation. It also occurred during the passage of a lithotrite, one during a skin incision and one during an operation for castration, and he has seen sudden and alarming syncope caused by the operator passing a finger behind the pectoral muscles and pulling them forward prior to their division in the course of a breast operation. So, too, as already pointed out, he reiterates the statement that during a prostatectomy, when the prostate is being removed there is a tendency for the pulse to vanish completely.

In regard to the treatment of circulatory shock, when it arises at the time that an anesthetic is being administered to a patient under operation, he asserts that the best measures to prevent it are to envelop all parts of the body except that to be operated upon in flannel or cotton-wool, and to administer an enema of beef tea and brandy just before the anesthetic is given. He does not seem to have much confidence in the preliminary injection of strychnine, but believes that the preliminary use of morphine, 1/6 to 1/3 of a grain, with or without atropine (1/120), is certainly advantageous. He also considers that ether is the anesthetic of choice, or a mixture containing ether, and believes that when chloroform is given an attempt should be made to retain a trace of corneal reflex when the procedure likely to induce shock is taking place. When the Trendelenburg position is employed he thinks that the danger from chloroform is much diminished, and he once more asserts that it is an erroneous dogma to believe that shock is avoided by deeply anesthetizing patients. The rule should be, in his opinion, the greater the shock the lighter the anesthetic. Circulatory shock he thinks rarely occurs under ether, and is avoidable under chloroform by gentleness on the part of the surgeon, the avoidance of deep anesthesia, and the placing of the patient in the Trendelenburg posture.

In this connection it is of interest to note that Waller in his recent address before the Section on Physiology at the British Medical Association has also asserted his belief that the majority of deaths which occur under the administration of chloroform are due to an overloading of the blood with the anesthetic, or, in other words, are the result of an overdose. This overdosage is the fault of the anesthetist, who gives the drug too freely, or he neglects to remember that deep and rapid respirations cause an overdose even if the quantity of the anesthetic present in the inhaler is comparatively small.

In another paper recently read before the Royal Society, Buckmaster and Gardner deal with the question of the percentage of chloroform present in the blood of anesthetized animals, which is quoted in an article in the *Practitioner* for September, 1907, by Blumfeld. He points out that Buckmaster and Gardner have found that a quantity of about 12 to 27.6 milligrammes per 100 grammes of blood is present at the time of the disappearance of the conjunctival reflex, and that although the lethal dose is variable it is found to be about 40 milligrammes per 100 grammes of blood. In other words, there is a very narrow margin between the dose necessary for anesthesia

and that which produces a fatal result. These investigators also found that the greater part of the absorbed chloroform is held by the corpuscles, the plasma holding very little of it unless the anesthesia is very rapidly induced. They do not place any confidence in the assertion of Desgrez and Niclaux that chloroform is decomposed in the organism and that carbon monoxide is present in the blood after prolonged chloroform inhalation.

In Brodie's report to the Special Chloroform Committee of the British Medical Association he estimated that absorption during the induction of anesthesia by chloroform showed that the rate of absorption of the drug is higher during the second minute of its inhalation than at any other period, while the volume of chloroform in the expired air is, during this time, proportionately less than at any other moment of the inhalation, which perhaps explains why it is that so many deaths from chloroform occur within a few minutes of the time that its administration is commenced. Blumfeld also points out that according to Vernon Harcourt the amount of chloroform retained is about one-third of that administered.

It is interesting in this connection, although it has no direct bearing upon the practical administration of the drug as a rule, to note that chloroform may be present in higher proportion in the milk of goats than in the blood, which perhaps is natural, when we remember that chloroform has a great affinity for fats. Similarly chloroform travels freely from the mother to the fetus in the guinea-pig at least, and the liver of the fetus holds more chloroform than that of the mother, so that Blumfeld believes that if during a difficult confinement a mother inhales large quantities of chloroform this drug may exert a deleterious influence upon the unborn child. He admits, however, that barring some drowsiness in such infants no material effects appear to have been noted, although in one case reported by Schwab, in which the mother took large quantities of ether, the infant at birth required active artificial respiration and its breath smelled strongly of ether.

INSTANCES OF THE VALUE OF PREVENTIVE MEDICINE.

The THERAPEUTIC GAZETTE has always endeavored to present the subject of which it treats in a careful and accurate manner, and has naturally devoted by far the larger part of its pages to the consideration of the application of drugs, or remedial measures other than drugs, to the cure of disease. It has, however, constantly recognized that preventive medicine is a field in which an immense amount is being done for the benefit of mankind at the present time, and has frequently called attention to the extraordinary advances which have been made along these lines within the last few years. These advances have depended upon the splendid abilities and unselfishness of the investigators as to the cause and distribution of infectious diseases, encouraged by the generosity of individuals, of states, or of nations. In this connection we desire to call attention to two facts which will undoubtedly prove of interest to our readers.

The British Government in India has been for many years actively engaged in the study of the best methods which can be utilized for the stamping out of bubonic plague, and the fact that the disease has, on more than one occasion, appeared and remained for a long time in San Francisco necessarily increases our interest in this important subject. Fortunately San Francisco seems to be the only place where it has obtained a foothold and remained limited, largely because of the intelligent efforts which have been made to control it, and perhaps for other reasons which we do not completely understand.

The general proposition that all efforts to control infectious diseases are desirable because every single human life is of value does not need emphasis, and when the loss of life from a single infectious disease rises to the extraordinary extent to which it has risen in British India, one cannot escape being appalled at the thought of its virulence. When it is considered that during the ten years and four months from September, 1906, to the end of April, 1907, 5,321,-

800 deaths were recorded in India from plague, and when it is further considered that 4,500,000 of these deaths occurred in the last five years, some conception of the importance of the epidemic can be reached. In other words, there have been nearly a million deaths a year from this cause in a population of 300,000,000, or one death in every 300 inhabitants, if every death has been recorded, which is exceedingly improbable in view of the wide-spread character of the epidemic. If these figures are expressed in another way, we recognize the fact that a number of people equivalent to the entire combined population of the city of London and the city of Philadelphia have died from plague in India in the last five years. In one province alone, namely, the Punjab, 1,750,000 people have died in this time, although the area of the Punjab is only slightly greater than that of Great Britain, and is smaller than that of Great Britain and Ireland combined.

Although these extraordinary figures, taken from Simpson's excellent lectures upon this subject, would seem to indicate that all efforts to control the disease amount to but little, on the other hand, the success of the efforts at San Francisco, and in other portions of the world, give us courage and hope that with good sanitation, and intelligent methods of combat, the disease elsewhere need not be so mortal.

It has been proved, as is well known, that the ordinary rat is one of the most active agents in disseminating plague, and that the fleas which infest rats are also active in its distribution, and particularly in extending the disease to healthy rats as well as healthy human beings. Simpson states that out of 247 fleas which were captured 60 per cent were human fleas, 34 per cent were rat fleas, and 6 per cent were cat fleas. Plague-like bacilli were demonstrated in the stomach contents of one out of 85 human fleas, and in 23 out of 77 rat fleas. Additional confirmation is, therefore, offered for the theory that rats and fleas are active factors in distributing the infection. The destruction of fleas and rats and the maintenance of great cleanliness in houses and in infected districts are therefore manifestly necessary measures for combating plague.

Plague may also be disseminated through food, and Klein has proved that plague bacilli taken with food multiply in the intestines, enter through the lymph channels, and so invade the body in swarms, the only protection against this form of infection being that the acid of the gastric juice in a certain number of cases destroys them.

Closely connected with these interesting facts is the address delivered by Professor Ronald Ross before the Fourteenth International Congress of Hygiene and Demography, held in Berlin in September last, in which he discusses the prevention of malarial fever in the British possessions, in Egypt, and in parts of America. With the extraordinary diminution which has taken place in the spread of malaria and yellow fever through measures directed against the mosquito all of our readers are familiar, and many of them will find Professor Ronald Ross's lectures a summary of the utmost value in regard to this very important question. It is, however, in connection with his remarks concerning the efforts of Colonel Gorgas, representing the medical corps of the United States army, that we have special interest. In his report Ross points out that the attempt by the French to cut the Panama Canal was foiled primarily by yellow fever and malaria, and that the death-rate during their attempt cost quite 50,000 lives, whereas Colonel Gorgas, when put in charge in 1904, although the country is, in Ross's opinion, the worst to deal with that he has ever seen, has produced results which are little less than miraculous. Thus, in 1906, amongst 5000 white American employees, the total death-rate was only 7 per thousand, and of these only 3.8 per thousand were due to disease. In a report which Gorgas made some time ago he pointed out that the sanitarian has now shown that any population coming into the tropics can protect itself against these two diseases, yellow fever and malaria, by measures that are both simple and inexpensive, and he even goes so far as to prophesy that

the centers of wealth, civilization, and population some day will be in the tropics, as they were in the dawn of man's history.

In conclusion we find much of interest and much to commend in the tribute which Ross pays to Gorgas and his colleagues. He says: "In this great work of Colonel Gorgas and his colleagues I recognize the attainment of that ideal which was set before me when, ten years ago, I found the zygotes of the parasites of malaria in mosquitoes. I regret only that the honor of attaining it has not fallen to my countrymen, as well might have been the case. But we must none the less congratulate the Americans on the splendid achievements with which they have signalized their entry into the lists of the colonizing nations of the world."

In this connection we must not forget that both the London and Liverpool Schools of Tropical Medicine have during this same period been exceedingly active in studying tropical diseases, and largely through their efforts we have a much better understanding not only of plague but of trypanosomiasis, whether it occurs in the form of "African Sleeping Sickness" or in that modified form of infection known as Kala Azar or Dum-Dum fever.

THE VALUE OF COD-LIVER OIL IN TUBERCULOSIS.

Twenty years ago a very considerable number of the profession regarded cod-liver oil as a sheet-anchor in the treatment of pulmonary tuberculosis, and, not understanding the pathological processes of this disease as accurately as might be, it was thought that this substance, which is at once a drug and a food, exercised a direct therapeutic influence. With a better understanding of the bacillus tuberculosis and the processes which it engenders, it became evident that cod-liver oil was only indirectly of value by aiding nutrition through its easy absorption and by its alterative constituents. It also became evident that the routine administration of cod-liver oil to tubercular patients was distinctly disadvantageous unless the patient could take it in addition to his ordinary food, and that when it displaced ordinary food, or destroyed the appetite and digestion, it not only did no good, but actually produced harm.

The use of cod-liver oil in tuberculosis is, of course, based primarily upon the fact that tubercular infection is usually accompanied by a marked loss of subcutaneous and other fats, or, in other words, by a wasting, and it was hoped that this fat might supplant that which was lost. This conclusion, however, was purely empirical, and, indeed, may have been said to have been based more upon theory than upon fact, for, so far as we know, there are few records which indicate that cod-liver oil materially adds to the weight of those patients with tuberculosis in whom the disease is already so far advanced as to be accompanied by rapid wasting.

It is interesting to note that J. W. Wells has recently carried out a series of experiments upon normal and tuberculous pigs for the purpose of determining the value of cod-liver oil when this infection is present. He finds that cod-liver oil is to be regarded as something more than a useful addition to the dietary of the consumptive pig, and he thinks that the oil has a distinctly curative influence in tuberculosis. A number of years ago Wells showed that cod-liver oil was easily assimilated, that it seemed to increase the assimilation of other fats, and also seemed to diminish tissue waste. This research was published in the *British Medical Journal* of October 18, 1902.

In the more recent series of observations the experimenter took young pigs of the same breed and age, and kept them in styes of the same type and size, feeding them in such a way that all were equally nourished, and giving cod-liver oil in doses proportionate to the body weight. After determining the dose of oil which a pig can readily utilize, the animals were rendered tuberculous by feeding the organs of tuberculous cattle or by inoculation with cultures of bovine and human tubercular bacilli. The animals were killed at various intervals, and then carefully examined, control experi-

ments being made by inoculating guinea-pigs. Wells found that the nutrition of tuberculous pigs was improved by the addition of cod-liver oil to other food, and that those pigs which received an emulsion of the oil did better than those which received the plain oil. He also claims that those animals which received the oil showed a considerable production of fibrous tissue in the infected glands with well-marked evidences of calcification, and that the oil helped to maintain their weight. These results, which are encouraging to those who are fond of administering cod-liver oil in tuberculosis, are of very considerable interest, although they do not by any means add to our knowledge of the action of this substance, for it is very evident that in these experiments the condition of affairs was identical with that which should exist in human beings to which the oil is administered, namely, that the oil was given as an addition to ordinary diet, and so enabled the animal to combat his infection. If at any time it had been used to supplant an ordinary diet, or had been used in such quantities as to interfere with the digestion of ordinary food, we have no doubt whatever that it would have produced an evil effect in pigs just as it produces an evil effect in man.

ACCURACY IN MEDICINE.

That accuracy in diagnosis and in the application of remedial measures to disease is absolutely essential to success is a fact which no one will deny, yet it not infrequently happens, impelled as we are by great anxiety to benefit a patient, that accuracy in thought is not adhered to, and therefore the best results are not obtained. In this connection we wish to call attention to an admirable address by W. Hale White delivered at the meeting of the British Medical Association in July. Speaking of the popular idea that uric acid is one of the chief causes of many of "the ailments to which flesh is heir," he points out that all we really know about gout is that the urate of sodium is deposited in some of the tissues, and that the blood contains an excess of uric acid. From this fact the practitioner often jumps to the conclusion that many cases of neuralgia, sciatica, and bronchitis are gouty, yet figures from the post-mortem room universally fail to show that these persons have deposits of sodium urate or an excess of uric acid in the blood. In such cases some practitioners are prone to speak of these manifestations as "irregular gout." Indeed, at the present time even the public tell us that their symptoms are caused by an excess of uric acid. As a consequence of this form of fictitious reasoning the assumption is at once reached that the excess of uric acid must be due to the foods containing an excess of this acid, with the result that some place the patient upon a carbohydrate diet, some place him upon a fatty diet, and some even give proteids. White then proceeds to state that he who believes that proteids are harmful is at least the most artistic, for he has an eye to color, and may as a concession allow white meat, although he prohibits red, and he asks, "Where on earth is there any justification for this? Are there any experiments showing that steaks lead to more uric acid in the blood than chicken?" which questions he answers in the negative. This fact, namely, that red meats are no more harmful than white meats, is one which we have repeatedly reiterated in these columns. As a matter of fact, although the ingestion of meat has enormously increased, the recurrence of gout has greatly decreased, yet at the present time gouty patients are dieted in a manner which has no basis in scientific fact.

In this connection it is interesting to note that many of the theories in regard to uric acid have about the same basis for their existence as the opinion expressed by Ibu Haukal, who, in 950, when describing the inhabitants of Palermo, said: "They have an evil habit of eating raw onions in excess; there is not a person among them, high or low, who does not eat them in his house daily, both in the morning and evening. This is what

has ruined their intelligence, and affected their brains, and degraded their senses, and distracted their faculties, and crushed their spirits, and spoiled their complexion, and so altogether changed their temperament that everything, or almost everything, appears to them quite different from what it is." White strongly suspects that in those days onions were a cause of irregular gout.

It is also a favorite theory with many people that a disordered action of the liver is responsible for dyspepsia, when it is well known that the liver can be almost destroyed by new growth or an abscess, and yet none of these symptoms arise, and that after death the majority of these cases of dyspepsia show no pathological lesions. Hale White urges upon us the necessity of confessing that we do not know the cause of the symptoms rather than the building up of a hypothesis which may give us comfort yet does the patient no good.

Figures are often employed in the form of statistics to prove certain postulates. Thus statistics are published to show the frequency of recovery after some difficult operation, although none are published to show the mortality among those not submitted to operation. In other words, we ought to compare the expectancy of life among those who are not operated upon with those who submit to operation, for it is perfectly clear that if an operation considerably shortens a life, more harm may be done by it than good.

In this connection it is also interesting to hear what Hale White has to say in regard to the present popular methods of interference for gall-stone trouble. When estimating the necessity for operating in such cases we must bear in mind that a stone impacted in the common duct rarely causes death. Thus, in the years from 1856 to 1894 only one patient not operated upon in Guy's Hospital died from gall-stone, although the total number of deaths from all cases was over 20,000. Naunyn has only once known the condition to be fatal. It is true that some distinguished surgeons have operated upon several cases with complete success, but Bland-Sutton, taking the figures of not only an individual operator but from the chief London hospitals and elsewhere, finds that out of 35 cases operated upon 10 died, or nearly thirty per cent. Then, too, it is difficult to distinguish between an impacted gall-stone and malignant disease, and in estimating the benefit that follows operation we must take into account the shortening of life owing to operation among those who are operated upon in the belief that they have a gall-stone, although they really have malignant disease. Again, figures have been published showing that after excision of cancer of the stomach a few patients were alive at the end of four or five years, and it is assumed that their life was prolonged. This may be so, but we ought, before reaching this conclusion, to find out how many people would have lived for this period of time if they had not been operated upon. The same facts hold true in regard to cases of exophthalmic goitre. Hale White is careful to let it be clearly understood that he is not objecting to the advances of surgery, or that he fails to appreciate the debt which physicians owe to surgeons because of their ability to operate in many cases heretofore considered inoperable. He urges only that wrong conclusions shall not be derived from statistics.

Finally, Hale White urges upon the profession a very important fact. As an excuse for incorrect or uncertain treatment the physician often says, "I must do something." He cannot see the reasonableness of this. The very fact that the medical man does not know what to do is, under these circumstances, actually used as a reason why he should do something, when in reality that is the very reason why he should do nothing, for he may do more harm than good. In other words, "to know when to interfere and when not to interfere with nature is a fine test of the sagacity of a clinical physician."

ACUTE UNILATERAL SEPTIC INFARCTS OF THE KIDNEY.

It will be remembered, particularly by those interested in surgery of the urinary organs, that Brewer, last year, in a communication on the subject of hematogenous renal infection strongly accentuated the obscure symptomatology, the rapidly fatal progress, and the successful treatment by early nephrectomy of the acute unilateral variety, noting, in accordance with the views of other observers, that the ordinary pus cocci may be eliminated through the kidneys without producing marked anatomical lesions, may cause a globular nephritis, multiple non-pyogenic infarcts, pyogenic infarcts, eventuating in multiple abscesses, perinephric abscesses, or rapidly fatal toxemia.

The lesions are usually unilateral and are secondary to bacteriemia, which may arise from absorption from the intestine, from acute infectious diseases, or from local suppurations. Diminished resistance of the kidney as the result of previous disease or injury is a favoring localizing factor.

Brewer cites numerous instructive cases tending to prove that in the graver forms of infection prompt nephrectomy is the only form of intervention likely to be serviceable. He concludes his paper with some remarks upon the diagnosis of the affection, which leave the reader in doubt as to whether a picture has been made out so clear and definite as to justify an operation as radical as nephrectomy in the presence of the symptoms enumerated. Brewer states that the disease may or may not be ushered in by chill. This, when present, generally indicates a severe type of infection. The initial rise of temperature is high, usually 104° or 105° F., the pulse being frequently 120 or above. The toxemia is marked from the first, and with the high fever suggests an acute grippe, lobar pneumonia, or one of the exanthemata. Then follows a more or less vague pain in the abdomen or flank corresponding to the side of the lesion. Tenderness and muscular rigidity over the region of the appendix or gall-bladder often lead to error in suggesting that one of these organs is the seat of disease. As the urinary secretion of the kidney infected is greatly diminished and is largely diluted by the abundant secretion from the unaffected organ, the mixed urine, when passed or drawn from the bladder, is often quite normal in appearance. The slight trace of albumin, blood, or pus is often overlooked unless a more than ordinarily careful examination is made. Brewer states that the only pathognomonic sign present in all cases is the marked unilateral costovertebral tenderness.

In regard to treatment, Brewer divides his cases into three classes. The first, the severe type, is that in which the temperature remains high and toxemia is rapidly progressive. These cases he states require nephrectomy at the earliest possible moment. The milder cases are those in which the initial temperature may be high, but begins to fall within forty-eight hours where the toxemia is less marked. These cases may often be successfully treated by decapsulation, which relieves congestion and allows nature to complete the process. When there are one or more abscesses they should be opened and drained. The mild cases should be expectantly treated with the prospect of recovery.

Brewer notes that of five patients, all exhibiting the severe type of the disease, all died after nephrotomy and drainage. After nephrectomy in eight patients of the severe type, all recovered. In five patients of the milder type, after nephrotomy, decapsulation, and drainage, all recovered, whilst by expectant treatment four or more patients of the mildest type all recovered.

Brewer's paper is a most serviceable one, in that it calls attention to a class of cases doubtless diagnosed as grip because alterations of the urine are not sufficiently pronounced to attract attention, nor are they likely to be detected except as the result of a careful examination. The report of his cases makes it evident that even those of greatest severity are characterized by but slight albuminuria and a few pus and blood cells. The generally conceived picture of

acute renal infection, certainly an erroneous one at the beginning of the attack, is of large quantities of pus in the urine.

All Brewer's cases exhibited the general symptomatology of profound sepsis. The diagnosis seemed to be arrived at rather by exclusion and by great dependence on costovertebral tenderness than by urinary examination.

In regard to his contention for early nephrectomy, this, if the diagnosis of unilateral involvement can be made, is probably conservative. But in these days of adequate instruments and men skilled in their use such a procedure is certainly not justifiable without previous catheterization of both ureters and examination of the urine obtained from each. In spite of his personal unfortunate experience as the result of conservative treatment, it also remains true that even the hyperacute cases may recover without operation.

RESECTION OF THE LIVER.

Garre, after stating that a number of methods have been invented, more or less complicated, for the accomplishment of hemostasis following resection of the liver (*Surgery, Gynecology, and Obstetrics*, September, 1907), observes that no method can be introduced into general surgical practice unless it can be executed with the simple means which every operator has at hand.

He reports cases which tend to prove that by some management the dreaded hemorrhage from the liver can be mastered by isolated ligation of vessels with silk and deep constricting suture of the wound with catgut. The thermocautery he considers distinctly contraindicated when large hepatic vessels bleed. Hence when an extensive operation upon the liver is contemplated no reliance can be placed upon the cautery, nor can much be expected from preventive hemostasis when the operation has advanced from the edge to the central portion of the organ. None the less, in the beginning of an operation it would be advisable to make as much use of clamps as possible.

Garre finds Doyen's elastic stomach clamps extremely serviceable, stating that any similar clamp does the same service, providing it has a long catching device; otherwise it has to be kept locked by a rubber tube attached to the handles and kept well stretched. Too energetic compression will produce embolism of the liver cells.

Langenbuch's proposal to produce preventive hemostasis by temporary ligation of the portal vein is open to grave objection.

Packing, which is extremely serviceable in cases of injury, ought to be considered last of all in cases of resection of the liver, where it is essential to primarily close the laparotomy wound.

As to the elastic ligature, Garre regards this as antiquated and dangerous. He calls attention to the fact that Kousnetzoff and Pensky have shown that the vessels in fresh human livers are no less resistant than arteries and veins of similar caliber in other parts of the body, and that their walls present sufficient firmness for isolated ligature. Moreover, it has been shown that the hepatic vessels in consequence of their elasticity can be drawn up from the cut surface of the liver to the extent of one centimeter. Hence if a circular suture of a vessel or a bundle of vessels has been performed ligature will and must be successful, however deep the thread may cut into the soft parenchyma. This has been shown by the success attending intrahepatic ligature in resection of animals. The method consists in applying ligatures *en masse* in a continuous row, so that no tissue remains free between them. The threads drawn taut crush the liver parenchyma, but the vessels resist. They are held and tied together like sheaves. The blood-pressure in the vessels of the liver is low, and therefore hemostasis is easy. It is not necessary to pull hard on the ligatures because a constricting thread can slip from the vessel in the parenchyma.

In careful and blunt dissection of the liver the bundles of vessels are first stretched to the extreme before being cut, and in consequence of their elasticity retract when cut behind the cut surface. Under such cir-

cumstances it would be impossible to accomplish hemostasis with artery forceps. Moreover, on the cut surface of the liver the large veins are frequently opened in an oblique direction, this making it extremely difficult to apply forceps and even more difficult to apply ligatures. A small circular suture is under such circumstances indicated. Fine silk is the ligature material of choice: it cuts smoothly into the parenchyma, is caught by it, and compresses the lumen of the vessels securely. For the deep sutures which go through the whole thickness of the liver Garre prefers thick catgut No. 2.

Garre states he succeeded in all cases with these simple methods of interrupted through sutures of the parenchyma with catgut. He has had no secondary hemorrhages or other complications, though he has performed resection so extensive as to require penetration of the liver substance to the extent of 10 to 14 centimeters from the edge. He admits that in some cases hemorrhage is considerable, even critical, but hemostasis could always be carried through.

He believes that the laparotomy wound should always be closed completely.

REPORTS ON THERAPEUTIC PROGRESS.

ON DRUG TREATMENT.

PENZOLDT, of Erlangen, in *Folia Therapeutica* for October, 1907, in an article on this topic says that to be honest we must own that a cause for the deviations in our pharmacotherapeutic results is to be sought in ourselves. The method of observation is inadequate; this may or may not be our fault. It is clear that the large number of prescriptions written in the course of daily practice of the busy practitioner renders the exact supervision of the therapeutic actions of his drugs impossible of accomplishment. He is, to a great extent, dependent on the statements of his patients, and on subjective impressions. Should improvement occur after the use of a drug, he will attribute it, according as he is more or less skeptical, to the remedy, or to the natural course of the disease. In practice it is often impossible to get over these difficulties. However, mistakes are made which are preventable. We should not unnecessarily complicate a problem which is already sufficiently involved by prescribing a number of drugs simultaneously. We should particularly avoid prescribing several drugs on one prescription. Many inactive drugs have acquired a therapeutic reputation simply because they have always been prescribed along with an active drug. We must endeavor to avoid being deceived by the patients who attribute their improvement, or the opposite, to the doctor's prescription. If we expect a definite action to result from the use of a drug, we should not tell the patient beforehand what effect we anticipate; thus we deprive ourselves, in these cases, of the effects of suggestion, an indispensable aid in other cases. On the other hand, we should never omit to point out any unpleasant secondary actions which may be produced. The chief point is to make it a rule to keep to signs which are capable of objective verification, and to regard the statements of the patients as of use only in case of need. A complete clinical examination before, during, and after the medicinal treatment affords the safest way of obtaining a correct judgment. Stated briefly, if a doctor desires to obtain the most reliable pharmacotherapeutic results, he must proceed with the use of a remedy in precisely the same way in which he would prepare an experiment, making the conditions of the trial simple and capable of ready supervision, carefully observing the results and judging objectively.

In closing these observations the author refers to the wholesale production of new remedies and preparations, and the danger arising from them to pharmacotherapeutics,

to the physician, and to the patient. For this flood of new drugs does constitute a danger, even acknowledging that among hundreds of superfluous or useless novelties a useful drug occurs once in a way. The only scientifically correct method of arriving at good new remedies is the following: The new drug is prepared in the laboratory of the synthetical or analytical chemist, it is examined most minutely in every way in the institute of the pharmacologist, and is then carefully and thoroughly tested on patients in the clinic, with the guidance derived from the chemical constitution, or the results of the pharmacological investigation. This method has already led to some fine results in isolated cases, but the way is strait and thorny, and is hence seldom trodden. The wider and more convenient way is the one more often used. The factory turns out a new product, often by reason of a very superficial analogy—for instance, a similarity to one already known as regards its action, or a combination of two active drugs; after a brief pharmacological trial it is handed to one or to several medical men for therapeutic examination and then thrown upon the market with a fine name, and often with a great flourish, as a remedy for all manner of diseases. Many substances and preparations are even proclaimed from the marketplace without any attempt to clothe the matter in a scientific mantle.

How do doctors regard this state of affairs? Unfortunately we have to admit that there are many who make immediate use, in their practice, of the preparations which are sent them dispensed in a convenient form, and bearing an attractive label. The author has even experienced cases in which doctors who were ill had tested these drugs on their own bodies to their own hurt, and this frequently occurs without the doctors knowing the composition and the action of the drugs, for their names often give no information, or at the most indicate the direction in which the therapeutic result is expected. This method is decidedly objectionable, and in favorable cases encourages the industry. The best safeguard against these trade efforts consists in the thoroughly chemical and pharmacological education of medical men. A chemist is often better able to judge of the real value of a newly recommended remedy than a medical man who is inexperienced in chemistry. If, however, the practitioner is not himself in a position to form an opinion of the nature and action of a new drug, he should await the experience of the clinical and hospital physician before he uses it himself. For the reasons stated above it is only possible to obtain a certain opinion of efficacy, or the opposite, of a new remedy in the hospitals. A healthy skepticism is the best safeguard, for the doctor as well as the patient, against injury caused by new drugs. There is no need for it to degenerate into complete mistrust; therapeutic nihilism has, luckily, been done away with. But a wise restraint exercised by the entire medical world is the only means of stemming the tide of new drugs, and of removing the stigma which threatens to alight upon scientific pharmacotherapeutics.

CERTAIN ASPECTS OF THE TREATMENT OF PULMONARY TUBERCULOSIS.

PHILIP in *Folia Therapeutica* for October, 1907, in discussing this subject asserts in regard to the action of creosote that, if not possessed of specific properties, it exerts a wholesome influence. The objection is sometimes raised regarding such drugs that it is impossible to introduce into the system an amount sufficient to kill the bacilli without, at the same time, gravely damaging the living tissues. In answer to this it has to be borne in mind that it is not a question of killing the bacillus, but rather of so modifying the conditions of environment as to make these unsuitable, or at least less suitable, for its development. It is possible too that creosote acts by neutralizing some of the products of the bacillus. Perhaps its chief activity is in the gastrointestinal tract, which it puts in better order, thereby improving intestinal metabolism.

As to dosage, it is convenient to com-

mence with 1 or 2 minims, and increase gradually to, say, 20 minims thrice daily. In respect of form little need be said. It is convenient to exhibit it in capsule, preferably along with, or after, food. Although less pleasant, it may be given as a liquid—*e.g.*, in wine, or emulsion of cod-liver oil.

Creosote may also be administered hypodermically, dissolved in sterilized oil (5 to 10 per cent), or per rectum. It may be used by cutaneous inunction, as in the unguentum creosoti, or the following:

℞ Creosoti, m. lxx;
Lanolini,
Adipis,
Ol. oliv., āā 3vj.

Or it may be exhibited by intratracheal injection, dissolved in oil (10 to 50 per cent). It is doubtful, as in all intratracheal injections, how far the agent reaches. There can be no question that by means of intratracheal injection the patient is frequently benefited. Conspicuous symptoms yield; cough and expectoration are lessened; and in many ways improvement occurs. Local tuberculosis of larynx and upper air-passages is certainly helped. It is probable that, so far as the lung lesion is concerned, the drug does not act by immediate contact; but the respiratory passages afford an absorbent surface whence the drug may be carried to different parts, as after absorption from the alimentary tract.

Inhalations of creosote—formerly so much in vogue—are probably of little service. The respirators which used to be worn are positively harmful, as impeding respiration.

If creosote is to have a fair chance, it is essential that reasonably large and increasing doses be used throughout a prolonged period. In the management of pulmonary tuberculosis, perhaps more than in any other chronic disease, there is a disappointing, if natural, tendency to change treatment too often. Such uncertain and irregular medication leads to sure failure.

Of its congeners, guaiacol, which has the same active principle, is the most important. Its action is essentially the same. It may be prescribed in doses of 2 to 15 minims, either in capsule, pill, or in solution, thus:

℞ Guaiacol, 1 part;
Alcohol (90-per-cent), 20 parts;
Aq., 180 parts.
Sig.: One to three teaspoonfuls twice or thrice daily.

Or the mistura guaiacol of Guy's Hospital:

℞ Guaiacol, m. iv;
Alcohol (90-per-cent), m. xl;
Glycerin, m. xxx;
Ol. cinnam., m. j;
Aq., q. s. ad 3j.

Or it may be given with sherry wine. It is combined pleasantly enough with cod-liver oil.

It may be given hypodermically, as in the following:

℞ Guaiacol, 5 parts;
Iodoform, 1 part;
Parolein, 100 parts.
Sig.: 15 to 30 minims once or twice daily.

Where the stomach threatens to be troublesome, or where there is difficulty as to the smell or taste of creosote or guaiacol, the same influence may be obtained by the use of carbonate of guaiacol, a white crystalline powder without taste or smell, which may be given in pill or cachet to the extent of 5 to 25 grains daily. The author finds it of excellent service in combination with arsenic. A good prescription is as follows:

℞ Guaiacol carbonat., gr. iv;
Acid arsenious, gr. 1/100.
Ft. pill. Sig.: One to three pills to be taken thrice daily.

Similarly carbonate of creosote is well borne by many patients. It occurs as a viscous fluid, of brownish color, faint smell, and slightly bitter taste. Conveniently given in capsules after food, or in soup or in wine, its use may be commenced with 3 to 5 minims, increasing to 30 minims thrice daily. Apparently it breaks up in the intestine into creosote and carbonic acid. It exerts both a local and general action.

It is wise to intermit the use of such drugs from time to time. It is also a good plan to exhibit them continuously for five or six weeks and then allow an interval of, say, ten days. There is something also to be said for variation in the form of drug.

Mention may accordingly be made of other trustworthy kindred preparations. The

number of these is considerable. The following three are deserving of special reference:

Styracol (cinnamate of guaiacol) has a well-merited reputation. It occurs as a white, crystalline powder, without smell or taste, hardly soluble in water. Its comparative insolubility makes it suitable for patients who have difficulty in tolerating creosote or other more rapidly-acting preparations. It seems to break up in the small intestine, where undoubtedly it exerts a beneficial influence in cases of diarrhea. It may be given in doses of 15 grains thrice daily.

Thiocol (ortho-guaiacol-sulphonate of potassium) is a white crystalline powder without smell, and of faintly saline taste, readily soluble in water. It may be given in large amounts without bad effect. It is conveniently given in cachet or pill to the extent of 5 to 30 grains thrice daily.

Benzosol (benzoate of guaiacol) is also crystalline, and almost odorless and tasteless. It is sparingly soluble; it is consequently serviceable where more gradual absorption is desirable. It is suitably exhibited in cachet or powder of 4 to 12 grains.

Space forbids further reference to individual members of this numerous and valuable series of drugs. It has been the author's aim to illustrate some of the methods to be observed in the treatment of pulmonary tuberculosis, but it has been impossible to cover more than a small portion of the ground.

If asked to sum up in a sentence or two the procedure to be followed in instituting treatment in a given case, the author states he should put it somewhat as follows: Determine as completely as possible the amount of damage present, both local and constitutional (this requires a review of every organ and function). Place the patient under the best physiological conditions, in respect of open air, diet, rest, exercise, clothing, bathing, etc. Consider the practicability of specific (tuberculin) treatment. Failing this, and in the absence of contraindications, exhibit creosote or similarly acting body for a prolonged period. Keep an eye on the patient symptomatically, meeting indications as they arise. Where neither tuberculin nor creosote nor other special agent seems practicable, rest content for the moment with the simpler, physiological line. In every case the aim should be the prosecution of a definite, as exposed to a drifting, policy.

SOME CONSIDERATIONS IN THE USE OF CARDIAC TONICS.

HAINES in *Folia Therapeutica* for October, 1907, points out that of the group of cardiac tonics all exert some action on peripheral blood-vessels; they may cause a most intense constriction, as in the case of apocynum or squill, or a very small effect, as in that of strophanthus. This difference in their action is of some importance when one is treating cases of heart disease associated with arterial degeneration and high blood-pressure. In these cases, when dilatation of the heart, back-pressure, and all the secondary effects resulting from it, are the result of persistently high arteria' blood-pressure, it is obvious that we should not be content in administering digitalis in the routine manner. We must aim not only at increasing the efficiency of the heart, but at keeping the vessels as much dilated as possible in the circumstances. For this purpose it has been suggested that vasodilator drugs, particularly the nitrites, should be administered along with the cardiac tonic. Unfortunately such a combination does not produce the desired effect. First the nitrite effect overshadows that of the cardiac drug, and vasodilatation is the prominent feature; then the cardiac drug obtains sway, and the dilatation disappears. Nevertheless beneficial effects have followed the use of erythrol tetranitrate combined with digitalis or strophanthus.

The author points out, however, that other vasodilators are now known which are almost as efficient as the nitrites, but without some of their objectionable properties: he refers to the purin derivatives—caffeine, theobromine, and theophylline. All these

bodies increase the rate of the heart-beat by direct action on the heart muscle, dilate the peripheral blood-vessels as has been shown by Dixon, and augment the flow of urine. Caffeine is of course a cerebral stimulant; it at first excites the vasomotor center and causes constriction of the peripheral arterioles, the central effect for the time being overshadowing the peripheral dilatation. Theobromine has little or none of this central action, and so it produces an immediate dilatation of the vessels, and is, therefore, a suitable substance for combination with the cardiac tonics in such conditions as that to which he has referred. It may be administered conveniently in the form of diuretin, which is a combination of theobromine with sodium salicylate, and has the advantage of being easily soluble. It affects the heart like caffeine—that is, it increases the rate and to some extent the force of the beat. An isolated rabbit's heart in one of the author's experiments showed the effect of diuretin, suitably diluted with Ringer-Locke solution, when perfused through the coronary vessels. One effect noticeable in this experiment, but which is not recorded on the tracing, is the marked dilatation of the coronary vessels. This action on the vessels was noted in another instance by a record of the rate of flow through the vessels of a frog perfused with a weak solution of diuretin in saline solution.

The combined action of a cardiac tonic with a vasodilator of the nature of diuretin is to slow and strengthen the heart-beat and to increase the flow of blood through the vessels, including the coronaries. To some extent the action of the tonic on the vagal endings would be neutralized by the action of the diuretin on the excitomotor area, but the vagal effect always overshadows the tendency to acceleration, and the heart consequently beats more slowly.

Theobromine differs from some other vasodilators in that it exerts a stimulant action on the heart. This was shown in still another instance in which was recorded the heart-beats of an isolated rabbit's heart perfused with saline solution. In this experiment the addition of diuretin to the perfusing fluid not only increases the rate of flow—that is, dilates the coronary vessels—but increases the force of the heart-beat. Perhaps one of the great disadvantages of administering digitalis in cardiac disease is that it tends to diminish the flow through the coronary vessels by constricting them. The author believes that this effect may be to a great extent overcome by giving the digitalis along with a theobromine preparation such as diuretin.

In addition to the coronary vessels theobromine dilates all other peripheral vessels, but owing to the augmented action of the heart the blood-pressure does not fall below normal, but tends to remain even a little above it. Diuresis is an early effect, and is secondary to the increased flow of blood through the kidney—that is, the vascular changes are primary to diuresis, not secondary; there is no evidence to show that diuretin has any specific action on the renal epithelium.

Such a combination of drugs as suggested has produced an excellent effect in cardiac dropsies, failing hearts, and, above all, in general degeneration of the cardiovascular system, following on persistent rise in blood-pressure. Fifteen grains of the theobromate may be combined with ten minims of a reliable tincture of digitalis, and administered every four hours for two or three days; but it is better after that period to omit the drug for some days, not only because digitalis is cumulative, but because the effect of the drug tends to diminish with repeated use in small doses.

ACUTE COLITIS AND ULCERATIVE COLITIS.

PHILLIPS in the *British Medical Journal* of June 8, 1907, insists that the treatment should be directed to lessening the amount of toxic substances in the colon, which may be readily absorbed by its ulcerated mucous membrane. Innumerable substances have been employed as intestinal antiseptics; probably but a small proportion of any of them, when given by the mouth, can exercise any direct effect so far down

the intestine as the colon, but they may, nevertheless, be beneficial by their antiseptic effect on the contents of the small intestine before they pass into the colon. Of all the antiseptics none is so useful in acute colitis as mercury in some form—as blue pill, or gray powder, or calomel—combined, if it produce diarrhea, with opium. Where the colon has been opened by operation the antiseptic powers of the mercury are very readily observable. It is surprising for how long—weeks or months—mercury may be taken in small doses in colitis without producing "mercurialism." Possibly mercury has a beneficial effect in colitis in other ways than by its antiseptic power, and certainly it appears to control the disease to some extent. Intestinal antisepsis may be assisted by antiseptic enemata, peroxide of hydrogen, or chlorinated liquors, added to the enema. But on no account must an enema be introduced with any force, or if it produces much pain. Weak solutions of nitrate of silver are useful in some cases.

Diarrhea may be checked by enemata with or without opium, or by bismuth salicylate, etc., given by the mouth. As a rule, even though several liquid motions are passed daily, there is a tendency to retention of feces in the bowel, probably owing to an atonic condition of the colon; and this requires occasional enemata. Purgatives, even simple ones such as castor oil or salines, may greatly aggravate the symptoms. But after the acute stage, gentle laxatives, such as part of a sulphur lozenge, which is also a good antiseptic, are allowable.

Melena may become so severe as to be a grave danger; enemata of adrenalin control this best, but in one case an opening of the cecum was made, and this stopped the melena after all other measures failed.

Hiccough.—Of the numerous drugs and modes of treatment tried, opium is the only one which has any effect at all, enabling the patient to get some sleep, but even it has little effect on the hiccough.

The nutrition of the patient must be carefully attended to, as the illness tends to be long and exhausting. Liquid foods seem best, and a mixed diet is advisable. The tendency to anemia must be anticipated, and a little fruit or lime juice is useful. Alcohol, ether, sumbul, and other diffusible stimulants may be required. In one case in which the inflammation was intense and phlegmonous the author gave large doses of perchloride of iron with seeming benefit.

Future investigations may provide effective treatment by "vaccines," but cases of colitis recorded in which this has been tried are not yet sufficiently numerous to give definite conclusions.

Colotomy or cecostomy has been performed, sometimes for the purpose of promoting recovery by diverting the passage of feces from the part affected, sometimes in order to lessen dangerous hemorrhage, and in one case under the author's own observation it had to be done to avert the dangers of acute obstruction. Colotomy has been thought to cut short the disease, and very possibly it may do so sometimes, but this cannot be assured, and in one case acute colitis continued for months after performance of cecostomy; in another a bad relapse occurred while there was still an opening in the cecum. When ordinary measures fail in arresting melena, opening the colon may be efficacious. In one case the patient's life was in extreme danger from hemorrhage, which greatly lessened after opening the cecum.

THE PHYSIOLOGICAL ACTION, ELIMINATION, AND THERAPEUTIC APPLICATION OF SODIUM CACODYLATE, USED HYPODERMICALLY.

DAWES and JACKSON in the *Journal of the American Medical Association* of June 22, 1907, combat the views of Fraser in regard to the value of this salt.

Of forty-five cases reported by the authors, thirty-four patients were either entirely cured or much benefited, eleven were in no way helped, and two were apparently made worse. In several of the second

class the failure may be due to the fact that they were among the earlier cases treated, the dosage being very small and there being certain faults in technique. In these cases a French preparation sold in tubes, each containing a solution representing 0.05 gramme, was used subcutaneously, with a short needle, the solution being cold. Later a sterile solution was made by dissolving the salt in distilled water. This, however, soon developed fungi, and on boiling gave off an alliaceous odor. Their present practice is to obtain the required amount of the salt, each dose enclosed in a gelatin capsule by the pharmacist; the drug is poured into the open end of a glass syringe, the plunger replaced, and the syringe then filled with boiling water; the site of injection, preferably the buttock, is then washed with alcohol, and a long needle is thrust deeply into the gluteal muscle and the warm solution injected. By this method little if any discomfort is complained of, and the warmth of the solution seems to add much to the rapidity of effect. Clinically it is usually noted that soon after injection there is a marked sense of exhilaration, and it is no unusual thing for a patient to come back after the cessation of a course and request a resumption of treatment on the ground that "it makes me feel so much better," a symptom common to arsenic medication.

Almost invariably the patient gains in weight, usually with considerable rapidity at first. In three of their cases a marked garlic-like odor to the breath was observed, in one this invariably coming on in half an hour after an injection of 0.05 gramme. One patient reported the odor in the perspiration about a week after injections of 0.2 gramme were commenced, and a complaint of a garlic odor to the urine is no infrequent occurrence. This odor may also be observed in inorganic arsenic medication.

Many of the French writers state that unless improvement commences after five or six injections it is not worth while to continue, and if one course has not proved beneficial a second is not likely to. The experience of the authors, however, is that rapidity of improvement depends much on the size of the dose, being slow with small doses and quick with large ones.

It would seem, therefore—if their data be accepted as correct—that Fraser and those who have accepted his statement have (as Fraser's paper seems to indicate) made their sweeping assertions as the result of a few clinical failures, and not as the result of careful physiologic observation.

PILOCARPINE AS AN ADJUVANT IN THE TREATMENT OF SYPHILIS.

ROBINSON states in the *Medical Record* of June 15, 1907, that in lues, particularly in those cases in which sufficient attention has not been paid to gastrointestinal elimination, to hepatic, renal, and dermic activity, he tries a few doses of pilocarpine, and is gratifyingly astonished at the results. Most remarkable is the effect of pilocarpine on salivation and stomatitis. One might think it rather strange to administer a powerful sialagogue in salivation. But the fact remains that nothing will stop mercurial salivation so effectually as will small doses —say two milligrammes—of pilocarpine. It is much more efficient in this respect than atropine or potassium chlorate; and the rationale is not difficult to understand. Salivation and stomatitis are caused by an excess of mercury embedded in the glands and acting as a toxic foreign body. Pilocarpine, being one of our most powerful glandular eliminants, acting both as a sialagogue and a diaphoretic, removes the useless excess of mercury, and thus cures the trouble by removing the cause. (Atropine, on the other hand, merely masks the symptom of mercurial salivation.) Another fact of which the writer has convinced himself again and again is that cutaneous syphilides which will obstinately resist the persistent administration of mercury will disappear rapidly if pilocarpine be administered for several days, either in addition to the mercury, or even if the mercury be discontinued altogether (provided of course the patient has had sufficient mercurial

treatment). The author explains the *modus operandi* of pilocarpine in such cases as follows: In most instances the greater part of the mercury administered is eliminated through the bowels and kidneys. If the amount to be eliminated is too large or if the ratio of elimination is too rapid, we get cramps and diarrhea on the one hand and mercurial nephritis on the other. Very little or no mercury is eliminated through the skin and sudoriparous glands, unless special care is taken to keep them at a high state of functional activity. The pilocarpine does just that. The system may be "saturated" with mercury, but the mercury may remain dormant and therefore useless. The pilocarpine, increasing enormously the activity of the skin, brings the mercury to the surface, the skin lesions are directly affected, and the syphilides therefore disappear. If pilocarpine be given for a week or two and then discontinued, it will be found that much smaller doses of mercury will be necessary in order to produce the desired effect.

Method of Administration.—The pilocarpine should never be prescribed in combination with other remedies—always alone. We can then increase or diminish the dose, or discontinue it altogether, at pleasure. The author prescribes the alkaloidal salt either in the form of pills, containing two milligrammes each (1/32 grain), and of these he orders two pills three times a day, sometimes increasing to three or four pills per dose; or he prescribes it in the following solution:

℞ Pilocarpinæ hydrochlor., 0.12 (2 grains);
Aquæ chloroformi, 120.0 (4 ounces).
Detur in vitro nigro. S.: ℥j to ℥ij t.i.d.

In not a single case has he observed any undesirable by-effects, and in no case could he find, though he carefully watched, symptoms of cardiac depression.

The author has careful notes of a rather considerable number of cases, in which the beneficial effects of pilocarpine were unmistakable; and he guarded carefully against falling into a *hoc-propter-hoc* fallacy. He expects to report these cases at a later date. In the meantime, asking the profession to give pilocarpine a careful trial as an adjuvant in the treatment of syphilis, he lays down the following propositions:

1. Pilocarpine is a most remarkable glandular eliminant, and glandular elimination is one of the most important factors in the successful treatment of syphilis.

2. Pilocarpine is of value in all secondary manifestations of the disease.

3. There are many cases which become intolerant to the further use of mercury; the system seems saturated, and continuing the mercury in such cases means injuring the patient. Discontinuing the mercury, giving pilocarpine in the interval, enables us to resume the former drug with excellent effect.

4. Pilocarpine should be prescribed alone, either in pills or solution, and should be given in doses of two to eight milligrammes (1/32 to ⅛ grain) two to three times a day.

THE TREATMENT OF CARDIAC DILATATION.

DUCKWORTH in the *Lancet* of June 15, 1907, tells us that the main indications for treatment are first to promote the power of the heart walls, and secondly to relieve the venous engorgement which has arisen from their loss of function. The more depressing duty is to unload the venous system. The question of depletion by letting blood has first to be considered, and the general condition of the patient as to strength, age, and history of the cardiac ailment will determine our action in this respect. It is seldom that we can be justified in a general venesection from the arm, unless it be in small amount, say to the extent of six or eight ounces. We shall oftener do well to limit our direct bleeding to the application of six or eight leeches to the epigastric or hepatic regions. This may not secure more than two or three ounces of blood, but the process of leeching, now so much neglected, is a source of more relief and comfort than the mere amount of depletion would indicate. There is a marked counter-irritant action induced

by leeching which has, doubtless, some beneficial effect. Certainly the relief thus afforded is very marked, the pain, tumidity, and oppression being greatly dispelled. A poultice should be placed over the leech-bites, and while this encourages further depletion it induces a favorable hyperemia over a large surface.

We may next try to relieve the hepatic congestion further by such purgation as the particular patient can bear with impunity, and in this way help to relieve the general systemic venous engorgement. By far the best purgative here is mercury in some form. To urge bleeding and the use of mercury in these days may appear to some as a revival of old and effete practices. We are supposed, especially by the public, to have abolished all such methods now and to employ simpler and better ones. Such treatment is thought to be weakening and blood to be too precious to shed in the twentieth century. In the opinion of the author this is nonsense, and not to employ such measures is to be void of all wise clinical instinct, and to be deprived of the only real methods of affording relief to our patients. It is hard enough now to implant this knowledge in the mind of modern students. Their minds are so full of imparted ideas about toxins, microbes, opsonic indices, neurons, and extra-pharmacopœial remedies that there is no room to hold precious knowledge of approved clinical methods and of the virtues of pharmacopœial drugs, and with all this modern development we are fast losing the old-fashioned art of medicine and have too little teaching of it in the schools.

The action of mercury is not merely a purgative one, but it is the best agent for lowering the resistance so commonly existing in these cases in the arterioles and capillaries, and thereby relieving the labor of the cardiac walls which is exhausting them. The sources of this obstruction probably lie in the liver or alimentary canal and are cleared away by mercurial influence. Calomel, blue pill, or gray powder (with colocynth and henbane), in doses of from two to five grains, should be given at once over night, followed by a saline aperient in the morning, and repeated for one or two nights, subsequently being taken twice or thrice a week according to the effect produced. The author makes no mention so far of digitalis or other tonic for the laboring heart, as he regards these as not being the primary needs. Relief will be already largely afforded in all directions by the treatment, and we may then begin with Baillie's well-known combination of blue pill, squills, and digitalis. By day we may give tincture of digitalis with nux vomica, ammonia, and compound spirit of ether in mixture.

The dietary is important. It should be rather dry if it can be borne. Small feeds every three or four hours with solid or semisolid food are best. Much fluid with the meal is objectionable, oppressing the stomach and the heart. Between meals the patient may take coffee, if possible, and fresh lemonade containing bitartrate of potassium one drachm to the pint. This is especially useful in removing any dropsy. If solid food is loathed we may use beef essence or jelly, or fish, pounded meats, scraped ham or chicken, or milky pudding in small quantities. Alcohol is commonly necessary, old brandy being the best form in which to give it. It is seldom necessary to exceed two to four ounces in the twenty-four hours. Two ounces of cold or hot water or of some alkaline water may be given at intervals if there is much thirst, and a larger quantity of hot water early in the morning is useful to wash out the alimentary canal and to promote a more free diuresis, which should be looked for. When the heart is relieved we generally find a more free urinary flow to occur. Later we may employ iron with strychnine or phosphoric acid with nux vomica as appropriate tonics. Ascites, if urgent, may demand tapping, and extreme edema of the legs, if it does not yield to the remedies just mentioned, must be dealt with by Southey's trocar, careful aseptic precautions being always observed. It may take several hours to relieve the abdomen by this method, but it is the safest one to

adopt. There is often difficulty in securing adequate rest and sleep at night. Recumbency is seldom possible, and if propping up by pillows is not adequate to secure easy respiration the patient is better allowed to sit in a properly adapted chair with support for the arms and a rest arranged for the head to lean somewhat forward. A full dose of compound spirit of ether, with 10 or 15 minims of a solution of morphine hydrochloride, may prove very soothing in the worst forms of restlessness and insomnia with dyspnea.

Under the influence of these measures it is often remarkable how much improvement may be wrought in these distressing conditions. Yet the patient is always in danger of relapses unless he is extremely prudent in all particulars. In hospital patients we see the worst symptoms in such cases. They secure marked relief, but a return to work or exposure to unwholesome environment and the varieties of the *res angusta* of the poor soon induce a recurrence of the original symptoms, and they return to die. For the better placed in society we may hope for a happier outcome with continued skilled supervision of their daily lives. But in them a time arrives when the measures we have enjoined fail to bring relief—the myocardium is worn out, recuperation is at an end, and a fatal issue is inevitable.

ASIATIC CHOLERA: ITS PREVENTION AND TREATMENT.

BRADDOCK as a result of large experience in Siam reports in the *Journal of the American Medical Association* of June 15, 1907, his views on this topic.

One of the most important things in the treatment is to keep the blood serum where it belongs, namely, in the blood-vessels. The method which has been successfully employed to that end will be referred to later.

In a large proportion of the severe cases shock and heart failure cause death, as in poisoning from cobra-bite. Sometimes there is no bowel movement before death. Second in importance as the cause of death is the dehydration of the body already referred to. Third in importance after the shock is over is uremia, to overcome which proper methods must be employed.

The results obtained by his treatment have proved so remarkable that they have elicited the thanks of many whose lives have been saved and who are now living and speaking testimonials of its efficacy.

The patient first receives from four to six tablets of the following formula:

> Cocaine hydrochloride, 1/20 grain;
> Creosote, ⅛ minim;
> Cerium oxalate, 2 grains;
> Pepsin, ¼ grain;
> Tincture of nux vomica, ⅜ minim.

This cocaine combination, which is listed in the catalogues of the American manufacturing pharmaceutical houses as "creosote comp.," absolutely controls the vomiting in the larger proportion of cases. As just stated, from four to six of these tablets are given at once. The patient is instructed to chew them up thoroughly before swallowing.

Before going further the writer wishes to say that all preconceived ideas of dosage must be abandoned in the active treatment of Asiatic cholera. Doses that would be prohibitory in the treatment of ordinary ailments must be given, and given promptly, for death is so inevitable, so sure, and so quick that the question of life or death depends on the work of minutes, or in some instances on the work of seconds. The serum of the blood is being poured out into the stomach and intestines, and consequently to save life enormous doses must be given and given promptly.

From three to five minutes after the cocaine compound just referred to, one or two tablets of the following formula are employed:

> Morphine sulphate, ⅙ grain;
> Hyoscyamus, ⅛ grain;
> Nitroglycerin, 1/100 grain;
> Citrated caffeine, ½ grain;
> Capsicum,
> Camphor, of each ¼ grain;
> Tincture of digitalis, 5 drops.

The patient is directed to chew these tablets before swallowing them.

Every few minutes, until the pulse can be felt at the wrist, the tablet of nitroglycerin 1/100 minim, with 2 minims of the tincture of digitalis, is given.

As soon as the pulse is felt at the wrist, no matter how feebly, the prognosis becomes more favorable. Now is the critical time in the case, and he who hesitates is not only lost, but he will certainly lose his patient unless he gives nitroglycerin and digitalis for effect. The author has given as high as twenty or thirty tablets in the course of a few hours with splendid results.

In the meantime the patient is given the following mixture:

> Tincture of eucalyptus, 4 fluidounces;
> Spirit of camphor, 2 fluidrachms;
> Tincture of capsicum, 30 minims.

This mixture is taken at one dose diluted with an equal quantity of water, and from teaspoonful to tablespoonful doses of tincture of eucalyptus are given concurrently with the other medicine every hour until reaction sets in. Mustard plasters and the application of heat to the body are not neglected.

These remedies stop the vomiting, produce reaction, and aid in overcoming the toxemia. By stopping the vomiting the loss of serum by emesis is checked, but it is necessary also to check the enormous loss occurring from diarrhea.

To keep the blood serum where it belongs, in the blood-vessels of the body, and thus prevent shock and dehydration, the author used large quantities of tannic acid in a modified form. He used heroic doses, and has given the equivalent of 120 grains (7.8 grammes) of pure tannic acid in twenty-four hours with the happiest results, giving it in 10-grain (0.65-gramme) doses after every bowel movement, or, oftener, 20 grains (1.3 grammes) every hour irrespective of bowel movement.

By stopping the loss of blood serum he controls the shock, which in his opinion is due in part to this loss. In fact, the patient is bleeding to death, not slowly, but rapidly, and in addition is also experiencing the terrible shock of the toxemia.

A great many patients promptly react as a result of this treatment, and then are attacked by suppression of urine, which often occurs at this time. To fight this he employs the tincture of eucalyptus in addition to the digitalis and citrated caffeine, which also act as diuretics.

The most vital thing in the treatment at this point is the absolute prohibition of food for thirty-six hours or longer. This prohibition must be absolute. The author has known a relapse to occur after eating a slice of orange or a teaspoonful of soft-boiled rice. Why this should occur he does not know, but asserts it is so. Vomiting and diarrhea at once recur, and the patient dies quickly. Many deaths occur at this stage, especially among the Siamese, who cannot be brought to understand that the symptoms will return if the smallest amount of food is taken.

The recovery is rapid unless complications occur. The writer has known cases in which the family informed him on arrival at the house that the patient was dead. Inside of a week the patient would be walking around, although very thin and feeble.

THE USE OF SODIUM CITRATE IN INFANT FEEDING.

To the *American Journal of Obstetrics* for June, 1907, PRENTISS contributes a paper on this topic. He says that when it becomes necessary to wean the healthy infant it is important to keep the proteid constituent to as high percentage as possible compatible with complete digestion; this is most easily done by adding sodium citrate to cow's milk that has been brought to the proper composition in regard to the fat, proteids, and sugar. The alkalinity is of much less importance with its use than when alkalies are used, which neutralize, more or less, the hydrochloric acid in the stomach, thus diminishing the coagulating property of the gastric juice as well as in-

hibiting the action of pepsin. The sodium citrate seems to enhance the action of pepsin by breaking up into sodium chloride and citric acid.

It has been abundantly proved that not only can richer proteid milk be digested with its aid, but a larger quantity can be taken and assimilated. On this point all the authors agree.

The digestion of the albuminoid content of milk is a subject of great interest to those who have under their care infants, young children, and invalids. Deviation from the normal digestion of casein is one of the most common digestive disturbances, if not the most common, in infancy, and gives rise to symptoms which show definitely that the percentage of the casein is too high, or an alteration in the coagulation has taken place with the formation of dense curds, which prevents the gastric juice from preparing it for the intestine. This form of dyspepsia is present in both breast-fed infants and those fed on cow's milk. It is in the cases that do not digest the latter that sodium citrate is of especial value. When proteids are in excess, or are not digested, curds appear in the stools; colic is very often present; constipation and vomiting or regurgitation of small quantities of food at intervals are the usual manifestations.

Variot recommends giving to nursing infants with proteid dyspepsia from two to four grains of sodium citrate in one to two dessertspoonfuls of water before each nursing.

The effect on the stools is most marked. In place of the hard curds before its use, Prof. J. H. Salisbury found soft, uniform movements, consisting of very fine débris, small particles of soap, but no fat or proteid, which indicates complete digestion of the milk.

Fresh cow's milk is the best preventive and cure of scurvy. Sodium citrate does not remove any of the natural constituents of milk, nor does it render any one of them unfit for use. Many infants have been treated by this method during the past two years, and so far no case of scurvy has developed among them.

Poynton gives the following reasons for its use:

1. It renders the curd of cow's milk more digestible.
2. It is cheap.
3. It is convenient to handle, easy to control, and progressive in principle.
4. It allows the milk to be given in a more concentrated form, and thus avoids to some extent the danger of underfeeding.
5. There is no danger of scurvy.
6. Given as a medicine it gains the confidence of the mother.
7. The taste is not unpleasant.

It should be used (1) in rare cases of complete intolerance of cow's milk; (2) in severe cases of gastroenteritis from impure cow's milk; (3) in organic diseases, such as congenital hypertrophic stenosis; (4) in very intractable cases which have been subjected to all sorts of different methods beforehand. This limitation, however, needs more investigation.

It sometimes causes constipation, according to some authorities, but this is by no means common, and at least one author, Dr. A. C. Cotton, thinks these cases are due to a low percentage of fat in the food. If constipation is present, Vanderslice recommends one drachm of olive oil at night. In the adult sodium citrate acts as a laxative. An accompaniment that can hardly be called a drawback is the fact that urination is increased and often persists long after the drug is discontinued.

So far there have been no untoward results from the use of sodium citrate.

Begin with one grain of sodium citrate to each ounce of milk in the mixture. If curds continue in the stools or if vomiting or regurgitation of curdled milk persists, increase the amount two grains or even three grains in bad cases. When the infant has gained well and is in good shape, gradually reduce the amount to one-half grain, one-quarter grain, and then stop altogether.

The most convenient way to prescribe the drug is in solution in such strength that each teaspoonful will represent the

amount to be added to each ounce of milk. Order enough to last one week, and direct the mother to have the infant weighed and report for instruction.

Molds often grow in the dilute solution, but can be prevented by adding one drop of chloroform to each twelve ounces, as suggested by Poynton.

HOW TO MEET TYMPANY AND COLITIS IN TYPHOID.

In the *New Orleans Medical and Surgical Journal* for July, 1907, DUPAQUIER says that the ordinary tympany due to fermentation is easily met by revising the diet, giving a slight purge, and possibly irrigating the bowels. But extraordinary tympany, in cases that are deeply toxic, tympany being due to paresis of the intestines, is not easily met. It is one of the features in the picture of the severe toxemia that is threatening the life of our patient.

The best measures against toxemia should be employed with the greatest punctuality: cold water and brisk rubbing over the whole body every hour; then throw a light blanket over patient, tucking it well under him, all this while disturbing the patient as little as possible. Do not depend on the weight of a large ice-bag, left for hours over the abdomen, to put tympany down; instead, apply constantly over the bowels, covering the loins, hot compresses, and put a hot-water bag to the feet.

Do not irrigate the bowels at all. Do not use the colonic tube at all. Do not purge.

Cleanse the mouth very thoroughly and increase feeding; expressed juice of porterhouse steak, well seasoned, soft, light pudding, custards, rice paps, soft-boiled eggs, by the small spoonful at the time. Good claret or good beer, instead of whisky, brandy, and champagne, are routine remedies. The patient must sleep, and if need be give trional.

He uses strychnine and starts with eserine, one one-hundredth of a grain, by the needle, three or four times a day.

All these measures tend to restore the "inhibitory function" of the great centers, and improve the nervous system at large, telling therefore on the whole economy, which in this predicament, is the best method to prevent dissolution.

Colitis appears occasionally, either in cases of obstinate constipation or cases of very frequent movements.

Dupaquier gives sweet-almond and castor oil, in equal parts, by tablespoonful dose, every hour until relief; or a pill of calomel-ipecac-rhubarb. He gives pure methylene blue, one grain every two hours, until diarrhea is checked.

In no case irrigate the bowels. Stop milk. Give egg-lemonade and vegetable bouillon.

Such drugs as carbolic acid and camphor, betanaphthol and bismuth subgallate are additional measures of value, checking colliquative flux with fermentative colitis.

RENAL DECAPSULATION FOR ECLAMPSIA.

The severity which characterizes an eclamptic seizure has stimulated the introduction of certain procedures of a most radical nature. Thus Edebohls suggested and carried out decapsulation of the kidneys as a means of arresting the progress of this dreaded condition. Although a number of apparently successful cases have been reported, the method has by no means met with general approval, and reports of its application by others are naturally of interest. DE BOVIS (*La Semaine Médicale*, No. 10, 1907) performed a renal decapsulation in a young woman who developed a severe eclampsia soon after delivery. None of the usual remedies seemed to have any effect and the patient grew rapidly worse. As a last resort the capsule was removed from one kidney without any trouble, disclosing an extensive ecchymosis of the organ. The coma which had been present disappeared soon after the operation and the urinary secretion was at once increased. The patient recovered.

The number of cases in which this operation has been performed is not sufficient,

however, to warrant the drawing of any definite conclusions regarding its value in eclampsia. Of five known cases, a fatal edema of the lungs was reported in one, and as the mortality of eclampsia has been stated to be about 20 per cent, the statistical evidence so far does not seem to warrant operation. As a matter of fact, however, it is usually only the severe cases in which uremia and anuria are prominent symptoms which are subjected to the operation in question. Another point to be borne in mind is that the kidney is not the only organ involved in eclampsia, so that it seems rather difficult to account otherwise for the improvement which has been noted in those instances where renal decapsulation has been carried out. Neither can the loss of blood be regarded as a possible factor, for it does not compare in extent with that which would be lost in an ordinary phlebotomy. It is quite evident that for the present the value of the operation referred to will remain *sub judice,* although future experiments and observations may contribute to its better understanding and appreciation.—*Medical Record,* May 25, 1907.

THE ACTION OF MAGNESIUM SULPHATE UPON THE HEART AND THE ANTAGONISTIC ACTION OF SOME OTHER DRUGS.

In the *American Journal of Physiology* for June, 1907, MATTHEWS and JACKSON report a research on this subject and conclude that in the frog during complete anesthesia from magnesium sulphate, impulses pass readily throughout the entire length of the cord and produce their normal effects upon the nerve endings.

The action of magnesium sulphate upon the heart is practically the same throughout the mammalian, avian, reptilian, and amphibian classes.

This action consists of a very marked depression, characterized by an immediate decrease in the amplitude of the heart-beat and of simultaneous progressive slowing, which soon leads to a complete standstill, from which the heart may be recovered by artificial stimulation.

Adrenalin and squills cannot be used to offset this depression.

Barium chloride and calcium chloride solution is much more effective in attempts to restore the heart when magnesium standstill has been induced; but even with the use of this solution magnesium is far too poisonous to be safely injected intravenously. Neither of these solutions seems to have much influence toward increasing the power of the heart to spontaneously originate its own contractions.

Magnesium sulphate injected intravenously has but little, if any, effect upon the muscles, nerves, or peristaltic movements of the intestines.

The nerve endings of the vagus, sympathetic, motor, and secretory (chorda tympani) nerves are unaffected by magnesium.

THE INFLUENCE OF SOME MEDICINAL AGENTS ON THE ELIMINATION OF URIC ACID AND CREATININ.

ROCKWOOD and VAN EPPS in the *American Journal of Physiology* for June, 1907, report a research on this topic. They conclude that when men are kept on a purin-free diet, or one where small and definite quantities of purin are present, the administration of lithium carbonate does not increase the elimination of uric acid—rather, it decreases it. The phosphoric acid is also lessened, although the amount of nitrogen is not affected.

Other compounds which make the urine alkaline—sodium citrate, sodium bicarbonate, and potassium acetate—even in large doses, do not increase the eliminated uric acid.

Colchicum acts like the lithium compound in decreasing, instead of increasing, the output of uric acid.

Both the sodium salt and the acetic acid ester (aspirin) of salicylic acid cause a marked increase in the urinary uric acid. In general the uric acid increases and decreases with the salicylic acid and compound administered. After the cessation of this administration the excreted acid falls much below the usual endogenous amount,

then slowly rises to normal. In one case, in which the subject had albuminuria, the aspirin did not increase the eliminated uric acid; but too positive conclusions cannot be drawn from this without further data.

In agreement with the observations of other investigators, the addition of chocolate to the food was not found to raise the amount of uric acid in the urine.

Creatinin was proved to be remarkably constant in quantity when these drugs were taken, as much so as was found to be the case by Folin with a meat-free diet.

As for the discrepancies between the results obtained by the writers and those of Macleod and Haskins, they can only explain them on the ground of their experiments being of shorter duration, and their averages, consequently, less conclusive. It can be seen, not only from their data, but also from those previously obtained by one of the two authors, that while the average excretion, under constant conditions, shows very little variation with the same individual, the amounts excreted from day to day are subject to considerable fluctuations. This is true even when a fixed diet is maintained daily throughout the experiment.

TUBERCULOSIS OF THE TESTIS IN THE INFANT.

POISSONNIER (*Gaz. d. hôp.*, Paris, March 16, 1907) draws attention to the fact that when tuberculosis attacks the testicle in young children it is usually the body of the testis that suffers most, in contrast with what occurs in the adult, when the primary incidence of the disease is on the epididymis.

Statistics show that tubercle of the testis is a comparatively rare affection in children, and that it usually appears before the age of two. From that time till puberty it is extremely rare. As a rule only one testis is affected, although cases are recorded in which the disease has been bilateral. Before the second year the two testes seem to be equally susceptible, while beyond that age the left is more frequently affected. Occasionally an imperfectly descended testis is the seat of tubercle. The condition is usually hereditary, and in some cases other tuberculous lesions, particularly tabes mesenterica and tuberculous peritonitis, are present. The infection may take place by way of the vas deferens, as in the adult, by the blood stream, or by way of the processus vaginalis, when the child is the subject of peritoneal tuberculosis. The morbid anatomy of the condition is the same as that in the adult, and the disease tends to infiltrate the peritesticular tissue to a greater extent. The epididymis, the vas, and the seminal vesicles and prostate may become infected by direct spread of the disease. If the processus vaginalis remains patent, infection may spread by this route to the peritoneum.

In a certain number of cases the affection comes on acutely, the testis suddenly becoming swollen and tender, and the scrotum red and painful. In the course of a few days the acute inflammatory symptoms subside, but the testis remains enlarged, bossy, and adherent to the scrotum, and eventually sinuses form, and the organ is destroyed by the tuberculous disease. As a rule, however, the disease runs a chronic course, similar to that met with in adults. In exceptional cases the first evidence of the disease is a large effusion of fluid into the tunica vaginalis.

Tubercle of the testis in the infant has to be diagnosed from syphilitic disease, which usually appears within the first few weeks of life, and is associated with other evidence of the inherited taint. The syphilitic lesion is usually bilateral; the testes are uniformly enlarged, globular, and painless. The tunica vaginalis may be thickened and the seat of hydrocele, but there are no inflammatory symptoms. As a rule, the testis undergoes atrophy, unless specific treatment is employed early. Among the other conditions of the testis from which tuberculosis has to be diagnosed are malignant disease and inflamed epiplocele.

The importance of medical and hygienic measures, including open-air treatment, is

emphasized. Opinion is divided regarding the necessity for radical operative measures when medicinal treatment fails. Some advocate partial removal of the epididymis or testis by scissors or sharp spoon, and the injection of iodine or iodoform, with a view to conserving at least some part of the testis, and so retaining its internal secretion. Others recommend complete excision of the gland, provided it is the primary and only focus of disease present. —*Edinburgh Medical Journal,* June, 1907.

TUBERCULOSIS OF THE TESTICLE.

KEYES (*Annals of Surgery,* June, 1907) reports one hundred cases of tuberculosis of the testicle, which showed in 71 per cent of the cases that the disease was first observed between the ages of fifteen and thirty-four. In nearly one-half the cases there was no previous evidence of tuberculosis when the testis first enlarged. A careful examination in Keyes's own experience has shown one of three conditions: tubercular bacilli in the urine, indurations about the prostate and vesicles, or a distinct haze in the urine due to prostatic catarrh. He therefore believes that a tubercular testis is always an index of general tuberculosis of the genital organs. Even in the case of primary orchitis the epididymis is always involved, although apparently exceptions are reported. In most of the cases the first nodule appears in the tail of the epididymis. In many of the cases the onset was acute—indeed, in one instance so markedly so as to simulate strangulation of the testicle. In many others it resembled acute gonorrheal epididymitis. Suppuration, softening, and breaking down occurred in more than half the cases in the first year of invasion. In the great majority of cases, even though the diseased testicle be removed that of the other side becomes involved, usually within four years of the time of operation. It is noted that suppurating cases do rather better ultimately than those which do not suppurate. He notes 30 per cent of cures in the suppurative cases watched for more than three years. He has no mortality to record—that is, none directly attributable to the testicle.

The three conditions with which the tubercular testicle is likely to be confused are simple epididymitis, syphilis, and neoplasm. Keyes gives the means for distinguishing these three conditions as follows:

1. Aspirations of hydrocele or drainage of abscess in order that the lesions of testicle and epididymis may be accurately palpated.

2. Familiarity with the clinical aspect of tuberculosis of the testicle—the little, rounded nodules; the diffuse infiltration of the epididymis; the acute epididymo-orchitis; the frequency of hydrocele and abscess; the ever-present sensitiveness to pressure.

3. Tubercular family history, upon which too much weight must not be placed, and tubercular personal history, which is often an important aid in diagnosis.

4. Evidences of tuberculosis in the internal genital organs, as evinced by active tubercular lesions, chronic tubercular nodules, or a slight haze in the urine and some pus in the prostate (which may be expressed by massage).

5. The diagnosis can be absolutely clinched by discovery of the tubercle bacillus in the urine, in the pus massaged from the prostate, or in the contents of hydrocele fluid or abscess.

6. Still further confirmation may be obtained by operation.

Yet that these signs may all fail he is sure from several cases in which the careful and close observation of months failed to distinguish absolutely between tuberculosis and other lesions.

He cites three cases, in one of which simple inflammation simulated tuberculosis; in another of which he advised the removal of a syphilitic testicle; and in the last of which a neoplasm of the testicle itself was very misleading. There is a pseudotubercular, simple epididymitis, the diagnosis of which may be very difficult.

Keyes's choice of operation is epididymectomy, which he performs with due re-

spect to the blood supply of the testicle, sometimes leaving the latter organ full of tubercles, with ultimate good results. If the patient appears with acute epididymo-orchitis he is treated expectantly until the lesion suppurates or becomes subacute. If it suppurates drainage is established, or exceptionally the whole testicle is removed. If it settles down into chronic epididymitis or if it begins as such the spermatic fluid is examined, and if this on several successive examinations shows no spermatozoa, both the tubercular epididymis and its unaffected fellow are excised. This will prevent relapses from the opposite side. Moreover, it will have a doubly soothing effect upon the prostato-vesicular tuberculosis. This early prophylactic operation should reduce the importance of the testicular tuberculosis to almost *nil* and prevent many of those tubercular outbreaks in other organs which seem to be fed from active or latent foci in the epididymis.

Among his conclusions Keyes announces that testicular tuberculosis is never clinically an isolated lesion; that sterility is frequent if not constant at the time the first testis is invaded; that relapses within the opposite testicle occur in a few years, in eight or nine out of one hundred; that such relapses are in no wise postponed by early removal of the diseased testis; and that slight tuberculosis of the testis may be depended upon to heal spontaneously after removal of the epididymis.

CEREBELLAR ABSCESS AND PUS IN THE LABYRINTH.

Le Brun (*Albany Medical Annals*, May, 1907) presented before the Medical Society of the County of Albany the result of Dr. Neumann's study in regard to the differential diagnosis between pus in the labyrinth and cerebellar abscess.

The symptoms common to both conditions are disturbed equilibrium, sensation of vertigo, nausea, vomiting, headache, and nystagmus. Optic neuritis is frequently present in cerebellar abscess, while it rarely occurs as a complication of pus in the labyrinth. It is rarely absent in cerebellar abscess in contrast to cerebellar tumor. Absence of fever is common to pus in the labyrinth and abscess of cerebellum, but the temperature may be elevated in either of these conditions. Retraction of the neck may be present in cerebellar abscess as well as in pus in the labyrinth, when the latter is complicated with serous or purulent circumscribed meningitis. Headache, which is especially localized in the occiput, in part also in the forehead, and which often becomes unbearable, seems to be characteristic of cerebellar abscess, while with pus in the labyrinth only slight headache occurs, also in the occipital region.

Disturbed equilibrium often occurs in cerebellar as well as labyrinth disease. It might, however, be absent in both diseases. It is present in cerebellar abscess when the disease has affected the parietal lobe and there is no distal effect on the vermis. When the labyrinth has for some time been in a state of total suppuration, disturbances of equilibrium are hardly of value in making a differential diagnosis. Vertigo may be present in cerebellar ataxia, while it is usually absent in the labyrinthine form of ataxia. Neither is the direction of the fall pathognomonic. When a patient with labyrinth disease is told to stand still and close both eyes we are sure he will always fall toward the diseased side. He will also deviate from a straight line when he walks with eyes closed. The disturbance of equilibrium is increased when the patient affected with pus in the labyrinth inclines his head toward the diseased side. In some cases, by inclining the head to the diseased side we get vertigo, nausea, or even vomiting. Friedrich and Neumann find the contrary to be the case at times. In cerebellar abscess the vertigo is generally increased by the patient lying down on the healthy side, and this is usually followed by vomiting. Koch says these patients also fall toward the healthy side, and deviate when they walk toward the healthy side.

The symptom to which Neumann would like to call attention in particular is nys-

tagmus, which almost never occurs in cerebral abscess. Neumann has almost always seen it in cerebellar abscess, and he wonders that it was not oftener observed by others. Perhaps the reason this symptom has been overlooked depends upon the fact that it frequently occurs only on lateral rotation of the eyeball. Nystagmus is regularly present in pus in the labyrinth as long as the vestibular apparatus is not entirely destroyed, and it is possible it may be present after the destruction of the sheath of the nervus vestibularis, as at first described by Jansen, and repeatedly after him.

This nystagmus is almost always directed toward the healthy side, and especially by looking toward the healthy side. It is either horizontal or rotatory. In a small number of cases, besides the nystagmus on looking toward the healthy side, there is also nystagmus generally of the horizontal type on looking toward the diseased side, and the nystagmus toward the healthy side is often a combination of horizontal and rotatory nystagmus. It is a peculiarity of nystagmus which is caused by disease of the labyrinth that it becomes weaker as the destruction of the labyrinth proceeds, and gradually disappears. It is therefore most violent in the first days of the disease of the labyrinth, and becomes weaker in the course of observation or disappears entirely.

The nystagmus referable to the cerebellum is of the same character as that referable to the labyrinth. In the form of this nystagmus we can plainly distinguish a slow and a rapid growing process, after which latter we can point out the direction of the nystagmus. We may find nystagmus in cerebellar abscess directed to the healthy as well as to the diseased side. A characteristic of this nystagmus is that it increases in intensity during the advancement of the disease, and at last reaches a degree which is never found in labyrinth disease.

Of especial significance are the following facts observed in the Politzer clinic: Nystagmus, which is due to pus in the labyrinth, may in the beginning appear directed toward the diseased side, which later almost entirely disappears, although the nystagmus toward the healthy side continues. It happens especially in abscess of the cerebellum. At first nystagmus exists toward the healthy side, which suddenly becomes a nystagmus toward the diseased side. When this symptom is observed we can with certainty make a diagnosis of cerebellar abscess, and in this way we can exclude nystagmus referable to the labyrinth.

In a great many if not in most cases of cerebellar abscess, the abscess is combined with pus in the labyrinth. When we perform a radical operation in these cases we encounter either a large fistula in the labyrinth, which demands opening of the latter, or on exploring we find a deep extradural abscess which compels our opening the labyrinth. While nystagmus referable to the labyrinth decreases rapidly in intensity after opening the labyrinth, the nystagmus referable to abscess of the cerebellum is not at all influenced by the labyrinth operations. When we have ascertained these circumstances, we can then positively make a diagnosis of cerebellar abscess and proceed in the proper manner.

The literature is silent in regard to this change in nystagmus, but Neumann can remember four cases in which the nystagmus on looking toward the diseased side either existed alone or was stronger than on looking toward the healthy side. Perhaps this symptom, which up to the present has been observed in eight cases, would be found oftener by more accurate observation.

There are two cases described in the literature by Okada and two cases from the annual report of the Klinik in Halle which support this opinion.

With regard to the operative procedures in cases of pus in the labyrinth and deep extradural abscess respectively, also in cerebellar abscess complicated with empyema of the sacculus endolymphaticus, Neumann holds the same views as Jansen, Trautmanns, Koch, and Okada. In the first place the labyrinth is to be opened from

behind and the dura is to be exposed with the sacculus endolymphaticus according to the customary method.

In this way we will often be guided anatomically to the cerebellar abscess through the deep extradural abscess which is frequently present, as well as through the necrosis and infiltration of the dura. If in this way the posterior occipital region of the dura has been laid free up to the inner auditory passage, we then introduce a knife four to five centimeters long, vertically directed across the sinus corresponding to the forward edge of the cerebellum, making the cut through the dura, where we know these cerebellar abscesses proceeding from the labyrinth have their seat; then vertically across this cut a second, two to three centimeters long, and then with the Preysingsehen brain knife toward the front, to the inside, to the rear, and upward in the cerebellum, entering correspondingly deep each time. If no pus appears then an especially constructed bent forceps suitable for this operation should be introduced through the opening in the dura, and in the great majority of cases we shall be successful in finding the existing cerebellar abscess. More difficult is their detection from the posterior pole of the cerebellum when entrance is made behind the sinus. In regard to the process when preceded by partially healed radical operation, Neumann disagrees with the suggestion of Okada, who advises to attack the abscess from behind the sinus in these cases.

Concerning the after-treatment of cerebellar abscesses, it is in fact sometimes easy in small abscesses; but in large abscesses, for example, in the one observed and cured by Neumann, which was four centimeters deep and four centimeters broad, the after-treatment became very difficult, as again and again pus gathered behind the introduced drainage apparatus. In addition there were continued vertigo, vomiting, and severe headache. In fact it is impossible with our present means to establish a true drainage in brain abscess where the sinus is fistulous and combined with necrosis of the adjoining tissues. The only means which finally did not fail was to change the dressings twice daily. In this case he also had occasion to convince himself of the actually marvelous action of peroxide of hydrogen on the brain abscess, caused by anaerobic bacteria. Since symptoms pointed to recent retention, it became necessary repeatedly to enlarge the opening of the abscess cavity with a forceps, and twice to elongate the incision through the dura backward beyond the sinus, and reopen the abscess. At this procedure large amounts of strong fetid pus were evacuated. But from the moment that he introduced strips of iodoform gauze saturated with a six-per-cent solution of peroxide of hydrogen in the abscess cavity and allowed them to remain, the disagreeable odor disappeared, the vomiting discontinued, and the formation of pus stopped as by magic. The patient recuperated visibly, and to-day he is completely cured and follows his vocation. The wound is completely healed, and it stands to reason that where anaerobic bacteria are present the hydrogen peroxide giving off oxygen must act as a specific, and he strongly urges the use of this remedy in brain abscess caused by anaerobic bacteria.

A CASE OF COMPLETE DISLOCATION OF THE FOURTH CERVICAL VERTEBRA FOLLOWED BY RECOVERY.

RIEDL (*Wien. klin. Woch.*, 1907, No. 2) records an interesting case of recovery following complete dislocation in the cervical region at the level of the fourth vertebra, an accident usually followed by irreparable injury to the spinal cord and death. The patient, a woman, aged forty-five, fell backward from a height of seven feet, landing on the shoulders and back of the head. For a day she was completely paralyzed below the neck. Next day she recovered slight power of movement in the legs. The arms remained completely paralyzed for four months, but thereafter gradual improvement set in. Five months after the accident she came under Riedl's observation,

still bedridden, with spastic paresis in the legs and arms, and pains in the neck, arms, etc. A marked depression was felt above the fifth cervical spine, which with the sixth and seventh could be easily felt. An *x*-ray photograph showed clearly a complete forward dislocation of the fourth cervical vertebra with the upper three vertebræ in line with it. Anteroposterior views showed no lateral displacement.

Although gradual improvement continued, an effort was made six months after the accident to hasten matters by reducing the dislocation. This was attempted first by applying extension under anesthesia, and then by exposing the cervical spine from the left side and combining direct manipulation with extension. Neither maneuver had the least effect in altering the positions of the bones. Four months later, at the time of the report, the patient was able to walk without support, the hand and arm movements were very much improved, and no sensory disturbances were present. The case is of interest as showing that such a lesion is not necessarily fatal. A similar case was published by Steinmann in *Langenbeck's Archiv,* Bd. lxxviii, along with nineteen cases in which death resulted.—*Edinburgh Medical Journal,* June, 1907.

TWELVE CASES OF MASTITIS TREATED BY SUCTION APPARATUS.

Fr. Hartmann (*Münch. med. Woch.,* Feb. 5, 1907; *American Journal of Obstetrics and Diseases of Women and Children,* May, 1907) details the treatment of twelve cases of mastitis of various degrees of severity by means of Bier's suction apparatus, with excellent results. He states that the bad results reported under such treatment are due to failures in technique. One mistake that is made is the use of too small a bell glass. The glass should be twelve or fifteen centimeters in diameter, and should cover almost the whole breast. A small incision should be made over the abscess if pus has already formed, since suction alone will not cause a collection of pus to be absorbed. If pus has not yet formed the focus may be dissipated. If too small a glass is used a severe pain will be produced and irritation of the focus of infection. The sitting should be about one-half hour in length, and suction should be applied for five minutes at a time, with three- to five-minute pauses between, and reapplications should be made four to five times. Milk should be emptied out of the gland afterward by a small glass. The sound breast should be nursed by the infant.

Another mistake that may be made is leaving off the treatment too soon, when a new focus may be produced, or a return at the old focus takes place. The results of treatment should be relief of pain and fever, and disappearance of fresh foci without incision in three to five days. If pus has formed with incision they should heal in one or two weeks, more quickly than under any other surgical treatment. The cosmetic results are good. The subacute, indurated forms are not suitable for suction treatment, but are better treated by pressure and massage. Old cases which have ruptured spontaneously are longest in healing. Suction permits of a better localization of the point for incision. Abscesses heal rapidly by absorption of the infiltration. Acute processes soon become less marked. Drainage is generally unnecessary, except when the abscess is very deep and narrow. Pressing on the abscess should be avoided as harmful. The pus soon lessens, and the secretion becomes serous. Wounds heal rapidly by granulation.

HEMORRHAGES FROM THE CENTRAL NERVOUS SYSTEM IN THE NEWBORN IN LABORS TERMINATED BY FORCEPS.

A. Couvelaire (*Ann. de. Gyn. et d'Obstet.,* Jan., 1907; *American Journal of Obstetrics and Diseases of Women and Children,* May, 1907) endeavors to show that infiltrating hemorrhages into the nervous system are frequent after difficult forceps labors. Their localization is generally in the cerebellum and medulla, in contradistinction to the cerebral hemorrhages which appear in weak premature infants

that die some days or weeks after delivery. The author has made a study of 213 autopsies made at the Baudelocque Hospital in the service of Pinard, during the last four years. There were seventy infants weighing over 3000 grammes—that is, well-developed infants—and among these were nine cases of hemorrhage in the medulla and bulb, with or without cerebellar hemorrhage; six of these occurred after forceps operations, one in a breech case and two by compression of the cord. Among the premature infants and weak ones there were eighteen cases of cerebral hemorrhage. The pressure in the bulbo-medullary hemorrhage is produced by the bones of contracted pelves, by the lower part of the cervix, which is insufficiently dilated, and by the perineum.

The author makes a study of six cases occurring after laborious forceps operations and gives his conclusions. There was an involuntary but severe pressure on the skulls of these infants in the course of forceps extraction, the process lasting from five to forty minutes. In one infant there was a dent in the frontal region due to pressure of the promontory of the sacrum, and in one a fracture of the sagittal suture from excessive biparietal pressure. The author concludes that hemorrhages are liable to occur when traction by the forceps has to act against resistance of the bones or soft parts. These hemorrhages are at a distance from the seat of pressure, in the medulla and bulbar region. This pressure drives the basal ganglia deeper into the spinal canal, and the ganglia are often infiltrated by extravasated blood. Preëxistent vascular lesions due to syphilis facilitate these hemorrhages after slight pressure by forceps. The cerebral substance is exempt from these hemorrhages in infants that are delivered at full term, while they occur in premature infants that die soon after birth. In the one case in which there was a fracture of the skull there was a cerebellar hemorrhage filling the arachnoid cavity throughout the cerebrospinal axis, as well as many interstitial hemorrhages in the bulbar region and cerebellar hemispheres.

FACIAL PARALYSIS IN THE NEW-BORN.

L. DEMELIN and P. GUENIOT (*L'Obst.*, Nov., 1906; *American Journal of Obstetrics and Diseases of Women and Children*, May, 1907) publish their observations of eighty cases of facial paralysis in the new-born seen at the clinic of Tarnier in Paris. Facial paralysis in the new-born is almost invariably of the peripheral type, involving the face on the same side as the nerve injury, while in connection with hemiplegia the lesion is central and involves the opposite side. Peripheral paralysis is complete when it involves the muscles of the entire side of the face, and incomplete when it does not attack those of the eyelids and frontal muscles, or involves only those of the lids and not of the mouth. In most cases the paralysis is of the complete type in the new-born infant. In hemiplegia with a central lesion it is usually incomplete. The injury to the nerve is from pressure on the trunk during delivery, generally by forceps. The point of lesion is just outside the stylomastoid foramen, where the nerve passes over a ridge formed by the bone. Soon after this it passes into the substance of the parotid gland, where it is protected, and bifurcates into the temporofacial, going to the muscles of the forehead and eyebrows, and the cervico-facial, moving the rest of the face. The muscles of the tongue and throat are never affected in this paralysis, since they are not innervated by the facial. The symptoms are a flaccid condition of the whole or part of one side of the face, while the normal muscles of the opposite side draw the mouth toward their side, the eye of the affected side remaining open and staring.

A serious complication is a syndrome characterized by convulsions and attacks of cyanosis. They occur within forty-eight hours of birth and indicate meningeal or cranial hemorrhage and pressure on the brain. The eyes may be affected by phlyctenulæ, ecchymoses, or edema. Cephalhematoma may occur, or lateral deviation of the jaw, cranial fracture, etc. Spontaneous paralysis, non-operative, does occur, but is rare and is due to compression of the nerve

against a projection of the bony pelvis, resulting from abnormal attitude of the head, such as imperfect flexion during labor. Paralysis due to forceps is the most common.

The authors found that out of 499 applications of forceps facial paralysis occurred in 30 cases. The grasp of the forceps must press directly on a point behind and below the ear to produce paralysis, where the anterior border of the sternomastoid muscle is behind the lobule of the ear. The anterior blade of the forceps is the one which does the harm, and if pressure is extreme it may cause hemorrhage and cerebral compression. The force employed in the use of the forceps is important. Extreme force may be necessary when there is an abnormal position of the head, poor flexion, or oblique inclination, which does not bring the anterior fontanel toward the center of the excavation. A symmetrical application of an elastic forceps will prevent trouble. Here the muscles of the neck protect the nerve.

Diagnosis of central paralysis may be made when the lesion is on the opposite side to the paralysis, when the paralysis is incomplete, and when convulsions or cerebral symptoms accompany it. In such cases the prognosis is grave. When the paralysis is complete, peripheral, and due to extreme pressure, it is quickly recovered from. If it lasts more than two weeks there has been too great force applied by the forceps. Hemorrhage at the base of the brain would affect other nerves than the facial at the same time, and other symptoms would be added to the paralysis of the face.

MESOSIGMOIDITIS AND ITS RELATION TO GYNECOLOGICAL AFFECTIONS.

RIES (*American Journal of Obstetrics and Diseases of Women and Children*, May, 1907) under this appellation recognizes, as do others, a condition of chronic inflammation of the connective tissue as well as the peritoneal covering of the mesentery of the sigmoid flexure. This chronic inflammation leads to shrinking of this mesentery, and in consequence thereof to a shortening of the base of the mesosigmoid, the result being that this portion of the bowel, being hindered in its free normal excursions, becomes a source of grave and constant danger. Of the causes of this inflammatory change two are firmly established in the etiology—one the so-called Graser's diverticula in the sigmoid, the other chronic inflammatory conditions extending from the neighboring structures, particularly the rectum and the female sexual organs.

Graser's diverticula are true or false—in the beginning usually false. They follow especially the paths of the blood-vessels in their routes through the muscular coats of the bowel. Fecal matter entering these diverticula stagnates there, and may, and frequently does, lead to inflammation, ulceration, and sometimes even perforation of these diverticula. The consequence of the absorption of septic material from these diverticula is the cause of the chronic inflammation of the mesosigmoid.

The symptoms of chronic mesosigmoiditis are as a rule not very marked. They consist mainly in constipation, flatulence, and more or less pain in the region of the sigmoid. Now and then the patients report a feeling of stiffening in the bowel, localized bloating, with acute, sharp pains in this locality. But as a rule the symptoms are not sufficiently characteristic to establish the nature of the affection, and the patients usually drag along with a diagnosis of intestinal fermentation or chronic constipation, until some day, particularly after an indiscretion in diet, the symptoms of an intestinal blockade become manifest. These may disappear again with or without treatment, and may repeat themselves at various intervals, or they may go on to the development of typical ileus, due to volvulus of the sigmoid, to which the mesosigmoiditis has given the predisposition.

This sigmoiditis gives rise, Ries holds, to volvulus. Hence he suggests that in the management of intestinal obstruction high up a precaution worthy of consideration is to investigate the conditions of the mesosigmoid after relieving the upper obstruction. If mesosigmoiditis should be found,

as a prophylactic measure he advises attaching the sigmoid or the mesentery to the parietal peritoneum by sutures.

GASTROENTERIC OBSTRUCTION IN EARLY INFANCY.

ROTCH and MURPHY (*Boston Medical and Surgical Journal*, May 9 and 16, 1907) give a detailed discussion of the diagnosis and treatment of gastroenteric obstruction in early infancy, and report two cases due to pyloric stenosis and one due to volvulus successfully treated by laparotomy. The symptoms of obstruction in infants are usually due to pyloric stenosis, but are in rare cases due to intussusception, volvulus, or appendicitis. The case of volvulus reported by the authors is the only one recorded as having been provisionally diagnosed and operated upon with success during the first year of life.

The symptoms of obstruction may begin at any time after the birth of the child. In pyloric stenosis the leading symptom is vomiting. It is mechanical in nature and expulsive. In uncomplicated cases it is not associated with nausea, or symptoms of gastric or enteric irritation. There may be periods of prolonged relief. Visible gastric peristalsis is often present, as is also palpable pyloric tumor, which is diagnostic. Constipation is the rule, and the discharges become meconium-like and pasty. There is loss of weight.

The condition must be differentiated from gastroenteric indigestion, which bears a close resemblance to it.

The treatment must be exact and intelligent. The stomach should be washed out and then allowed to rest, the nourishment being supplied in the meantime by enemata of one-half to one ounce of peptonized milk and ten minims of brandy every four hours. After twenty-four hours' rest a feeding of good milk should be given, and if this is vomited in an expulsive manner a feeding of whey should be given two hours later. If this is also vomited a condition of obstruction should be recognized. Then should be given sodium bicarbonate or lime-water to render the milk alkaline. If no improvement follows, operative treatment should not be further postponed. If rectal feeding has not been systematically and properly used, the condition of these emaciated pyloric stenosis patients may be much improved by giving three to four drachms of peptonized milk by rectum for twenty-four hours before the operation. Moderate stimulation by brandy or strychnine is also given to advantage, either subcutaneously or with the enemata. In case the rectum is not tolerant, infusion of normal saline solution should be tried for twenty-four hours in the cases which are so much reduced as to be very poor surgical risks. Infusions under the pectoral muscles give the best results. An infusion should be given every three hours on alternate sides, and as much fluid injected as the subpectoral space will hold without too great tension.

The anesthetic of choice is ether. Only as much as will prevent the child from actually straining or vomiting should be given. Under-etherization is never a serious matter with these diminutive patients, for they are easily and quickly controlled; over-etherization is a very serious calamity.

Before the operation the stomach should be thoroughly washed out. In operations on infants the avoidance of shock becomes a paramount factor, the importance of which is not infrequently overlooked. Maintenance of the body temperature is absolutely essential; therefore the chest and extremities should be enclosed with warm bandages before the infant is taken to the operating-room. The temperature of the operating-room should be at 90° or above. The top of the operating table should be artificially heated. If such a table is not available a heated top may be improvised by placing a blanket over a row of hot-water bottles.

Manipulation of the parts and hemorrhage must be reduced to the minimum, for in these tiny patients rough handling of the abdominal contents or a profuse bleeding is fatal to success. The necessary rapidity of operation has been perhaps overemphasized. A degree of speed that leads to the slurring of any technical details in these operations

for pyloric stenosis is most dangerous, because not only must the line of sutures be absolutely tight, but the parts must be correctly placed for the operation and retained in their proper relations after the operation. Under proper conditions, and with gentle manipulation, these patients stand an operation of thirty minutes well. The second half-hour is not so well borne, and of course an extension into the third half-hour is not to be considered. Unless unusual complications are met, thirty minutes is ample time for the necessary operation. After operation there is great need for the most exact feeding of the patient. Only good breast milk or carefully modified milk should be used. No food should be given by the mouth for twenty-four hours. During this time enemata of four drachms of milk and ten minims of brandy should be given every three hours.

Volvulus is not common in infants. Its symptoms vary greatly. The diagnosis is practically one of obstruction, the knowledge of the exact nature of the obstruction not being necessary. The treatment is essentially surgical. Attempts to move the bowels by cathartics only increase the distress and the torsion. In operating for volvulus the primary object is to relieve the obstruction of the intestine. This is of course accomplished by untwisting the volvulus. If it is possible by suturing the abnormally long mesentery, or fixing the intestine to the abdominal wall, to prevent the recurrence of the volvulus, this should be done. With these infants, however, with their reduced resistance, prolonged manipulation is never justifiable. What is to be done must be done simply and rapidly. If only the volvulus is reduced it is possible, of course, that it should recur, but this will not necessarily follow, for, as has been mentioned above, the conditions which are necessary for the formation of the volvulus are not infrequent in infants, yet volvulus rarely occurs. Therefore it is probably fair to assume that the exciting cause of the first rotation will not be duplicated.

Should the intestine contained within the volvulus be considered non-viable, the whole gangrenous area, with as much of the mesentery as is involved, must be removed to prevent sepsis; but in these extreme cases whatever procedure is followed will probably be of no avail. After such an incision suture of the intestine should not be considered. The ends should be drawn out and contents allowed to drain externally. In the case of a volvulus of the large intestine it may be wise to establish an artificial anus in order that the obstruction which might result from the paralysis of the bowel be at once relieved, but this procedure is not well borne by young infants. In these cases, therefore, the operation is reduced practically to the simple untwisting of the volvulus.

DOUBLE HARELIP—NEW OPERATION.

The inadequacy of any hitherto described method of treating harelip (*Deutsche Zeitschrift für Chirurgie*, lxxxvii, 4) led LORENZ to devise a new procedure, which he describes in detail with the aid of diagrams and photographs of his patient, a girl of ten years, whose deformity was most extreme.

In cases of double harelip the premaxillary bone is never united to the maxillary proper, and is therefore loose and not of any use in mastication. It is claimed, however, that if this bone is removed the upper set of teeth will be smaller than the lower, and proper apposition of the jaws will be impossible. Attempts have been made in many cases to place the premaxillary bone in its normal relation to the maxilla, but as there is no septum narium cutaneum, this operation draws the tip of the nose back against the upper lip and produces an extreme deformity. In spite of all efforts the premaxillary remains loose, and the tension of the upper lip, the ends of which must be brought together in front of it, draws it too far back and produces a deformity quite as marked as that caused by removing it. Some surgeons remove a wedge-shaped piece from the lower lip and implant it in the upper, but this makes a very ugly scar in each lip. The results of these methods are good only in mild cases. The objection that the removal of the premaxillary makes the upper jaw

smaller than the lower is not well founded, and nothing is lost as regards chewing, as the loose bone is of less use than a prothesis. The tendency of the upper lip to stand behind the lower is due to too much tension on the lip after bringing the halves together. This extreme tension may be avoided by freeing the tissues of the cheek from the underlying bone. The requirements of an operation are that it shall restore the failing septum cutaneum and reduce the external scarring to a minimum. Deformity is best avoided by cutting the alæ of the nose free from the cheek and replacing each separately.

The case in question showed a small and rudimentary premaxillary, with two misplaced carious teeth. This protruded like a snout, and the central part of the lip was directly continuous with the tip of the nose. The lip-red at the side also passed directly into the alæ nasi, which were drawn outward. The bilateral cleft in the palate was unusually broad, and the palate very high arched. Union of the halves of the lip in front of the premaxillary was out of the question.

The following operation was performed: The premaxillary was removed with strong bone forceps and the anterior edge of the vomer was freshened. Then the central part of the upper lip was freed and split between the skin and the mucosa, so that a narrow strip of tissue, attached by its front end to the tip of the nose, and consisting first of skin, then of lip-red, and lastly of mucosa, was obtained. This was drawn back and attached to the edge of the vomer, forming a septum cutaneum, and then passing between the halves of the lip was sewed to the alveolus, and closed the gap left by the removal of the premaxillary. The alæ of the nose were then freed from the cheek by an incision down to the bone, and the lips freed from the bone from the alveolus to the orbit. The parts could then be brought together in the middle line with no tension. The free edges were trimmed and united. The alæ of the nose were then brought into proper position and fixed to the cheek tissues in their new position. The shape of the nose was better than before the operation. This left a small opening on each side, between the lip and the septum, passing directly into the mouth. The edges of these openings were freshened on the twenty-first day and the defect closed. Union was by first intention without scar contracture. An operation to close the palate failed. When a prothesis was made, this closed the opening in the roof of the mouth, supplied the missing front teeth, and pushed the upper lip a little forward. The cosmetic result was remarkably good. The scars were not noticeable and the nose was properly formed, the tip not being drawn backward at all.

EXTENSIVE INTESTINAL RESECTION.

Although we know that the digestive function can be perfectly carried on if the stomach and large intestine are cut off from their connection with the digestive tract, large resections of the small intestine are known to be dangerous, and the possibility of extensive resection of this part, as shown by STORP (*Deutsche Zeitschrift für Chirurgie,* Band lxxxvii, Heft 4), is of great interest.

There is so much additional danger of injuring the ducts of the liver and pancreas when the duodenum is attacked that the results of resections of this part of the bowel are not favorable. The jejunum and ileum together vary in length from 14 to 28 feet, according to the height of the person and individual differences. It is rather less than four times the length of the body. By calculating as closely as possible, it is found that in some cases about two-thirds (!) of this have been removed and the patient did not suffer permanent loss of digestive power. The stools of such persons have been found normal, so that there was no marked loss of absorptive power. Of course the matter is frequently complicated by the fact that the bowel remaining is not perfectly healthy, and in cases of general disease such extensive resection would not be safe. In any case it is wise to restrict eating an excessive amount of food until the system is accustomed to the altered conditions.

PROPHYLAXIS AND TREATMENT OF POSTOPERATIVE PHLEBITIS.

BROTHERS (*American Journal of Obstetrics,* May, 1907) summarizes the prophylactic treatment of phlebitis as follows:

Careful attention to every aseptic and antiseptic detail in every operation; adequate drainage in purulent or infected conditions. In gynecological abdominal surgery, this implies the use of the vagina or lower portion of the abdominal incision, or even the removal of the uterus for purposes of efficient drainage. The Fowler elevation of the bed is a useful postoperative adjunct to carry out this end. Some operators, even in this class of cases, will urge their patients early out of bed with a view of preventing postoperative phlebitis.

In aseptic, non-purulent intra-abdominal conditions which are submitted to other than fixation operations the occurrence of postoperative phlebitis will be reduced in frequency by getting such patients out of bed before the end of the first week.

In regard to the treatment of phlebitis when actually present all surgeons are agreed. Rest of the most absolute character, with elevation of the affected limb, is the prime indication. It is customary to wrap the extremity in cotton and keep it in place by means of a loose bandage. An ice-bag over the most tender area will give comfort and relieve signs of inflammation. Frictions and massage are advised by some authors, but the writer believes that the best interests of the patient—particularly in avoiding the danger of breaking the clot prematurely and distributing emboli throughout the circulation—are subserved by omitting these measures.

REVIEWS.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By James M. Anders, M.D., Ph.D., LL.D. Eighth Edition, Revised. The W. B. Saunders Company, Philadelphia, 1907. Price $5.50.

The appearance of this standard work upon the practice of medicine in its eighth edition is the best possible evidence that it has proved useful to a large number of students and practitioners. To those who are not familiar with its pages we may say that the arrangement of the text is along the lines commonly followed by works upon this subject, the opening article being upon typhoid fever and the closing portion of the volume dealing with diseases of the nervous system. We note with interest that Dr. Anders believes that typhoid fever is feebly contagious in distinction from being infectious by the ingestion alone of the bacillus in food and water. In connection with treatment we note that the author believes that alcohol is a useful drug as a stimulant, and that it should be used regardless of the degree of temperature. He believes that alcohol is the best spur for the flagging heart and for the purpose of combating the complex nervous symptoms and typhoid septicemia. The use of camphor hypodermically as a stimulant for profound systemic infection was introduced many years ago by Graves, of Dublin, although another is given credit for its employment. In connection with the employment of the cold bath Dr. Anders recognizes the difficulty which prevails in regard to the institution of this measure in private families, and so considers substitute measures which can be employed in its place. We are glad to see that he emphasizes the necessity of friction when cold is employed, but we question whether the placing of a patient in a wet sheet, around which is wrapped a blanket, produces results which are in any way to be compared either in character or in value with the true application of cold, since this method fails to produce reaction, which, after all, is the dominant factor which we are seeking. We question very much whether saline solution given in cases of intestinal hemorrhage exercises any hemostatic effect, and rectal injection in these

cases seem to be inadvisable in that they are prone to increase peristalsis. We disagree with the author that solid food should not be allowed until the temperature has been normal for at least one week, and we regret that he does not advocate the more free feeding of the ordinary typhoid fever patient, whose chief chance of recovery lies in his ability to combat infection by maintaining the best possible degree of nutrition. We also note with interest that the author apparently considers that alcohol is the best stimulant to be administered in cases of croupous pneumonia, a view with which many practitioners differ. We think that if the doses of digitalis, namely, 5 to 15 minims of the tincture every third hour, are continued for more than a very short time, they may produce evil effects.

Under the head of the cause of rheumatism we fail to find any reference to the micro-organism of Poynton and Payne, and in the treatment of acute articular rheumatism we find no mention of the local employment of ichthyol, which in our experience has been the best local application which can be employed. We thoroughly agree with the author that it is essential that the patient shall not get up too soon, but we think that for him to remain in bed for a week after his temperature has become normal is too short a period, not because getting out of bed at this time will be so prone to produce a second attack as because it is essential that the endocardial inflammation, which has been produced by the infection, shall undergo complete repair before any extra strain is placed upon the heart.

Careful examination of the book reveals a number of other instances in which the methods of treatment differ materially from those which we ourselves employ, but these instances are only illustrations of the fact that different men have different ways of treating similar conditions, and Dr. Anders's large experience makes any opinion which he may express well worthy of careful trial. The constant endeavor made by the author to sustain the book in the forefront of works upon this subject will doubtless maintain its popularity.

OBSTETRICS. A Text-book for the Use of Students and Practitioners. By J. Whitridge Williams. Second Edition, Revised and Enlarged. D. Appleton & Company, New York, 1907.

The first edition of this book, which appeared four years ago, was at once recognized as being prepared by one who by training in the laboratory and at the bedside was amply qualified to compose its text. We understand that the book has been well received by the profession here and abroad. In the present edition the chapters upon the development of the ovum and upon the toxemias of pregnancy have been entirely rewritten, and sections have been added upon the metabolism of normal pregnancy, vaginal Cæsarian section, pubiotomy, and contraction of the pelvic outlet. The rest of the book has been thoroughly revised and many minor changes made. Old illustrations have been replaced by a number of new ones. The result has been that the book is considerably increased in size. The illustrations are many of them original and are most excellent. Many of the chapters conclude with an exhaustive bibliography of the subject considered, so that the work is at once a handbook and one for reference.

In regard to the treatment of eclampsia the author recommends the administration of chloroform during the convulsive attacks, in the hope of cutting them short, followed by comparatively full doses of morphine hypodermically, beginning with ¼ grain and repeating rapidly until three doses have been given. He states that some advise the administration of 30 to 60 grains of chloroform per rectum. A drop of croton oil and a drachm of olive oil or Epsom salts are to be administered through a stomach tube. If the convulsions occur during pregnancy or labor, delivery should be effected as soon as is consistent with the safety of the patient. Cæsarian section in these cases does not seem to produce the results that one expected of it. After the birth of the child no attempt should be made to hasten the third stage of labor, as a moderate loss of blood should be encouraged rather than checked. When the convulsions continue after birth about a pint of blood

may be drawn from the arm by venesection, and then followed by a normal saline transfusion. The author does not believe that venesection is limited to those with a full, bounding pulse, but states he has employed it with advantage in patients whose pulse was thin and weak. Dr. Williams evidently is not a believer in the employment of veratrum viride, as he states that in the East Indian Medical Service its use for twenty years showed a maternal mortality rate of 45 per cent.

CLINICAL THERAPEUTICS. A Handbook of Special Treatment of Internal Diseases. By Alfred C. Croftan, M.D. Second Revised Edition. The Cleveland Press, Chicago, 1907.

This book is not a treatise upon therapeutics in the ordinary sense in which we understand this subject. On the other hand, it is rather a small "Practice of Medicine" in which most of the text is devoted to a consideration of the methods which the author thinks are best suited to the treatment of diseases of the circulatory system, the disorders of metabolism, the diseases of the digestive tract and respiratory system, and the various infectious diseases. The sections on the important infections are written upon by collaborators. Thus, the article upon Pneumonia is contributed by Dr. E. F. Wells; that upon Smallpox by Dr. Heman Spalding; that on Syphilis by Dr. R. Kriessl; and that upon Scarlet Fever by Dr. W. L. Baum. A noteworthy characteristic of the book is that it has marginal annotations which act as a key to the paragraphs to which they are attached. The book is a first-rate one for the general practitioner, but is not designed for the undergraduate student. It is handsomely printed and, because of its text, deserves a cordial reception.

A TREATISE ON DISEASES OF THE SKIN. For the Use of Students and Practitioners. By Henry M. Stelwagon, M.D., Ph.D. Fifth Edition, Thoroughly Revised. W. B. Saunders & Company, Philadelphia, 1907. Price $6.00.

When the first edition of Dr. Stelwagon's book appeared but four years ago we prophesied that it would at once obtain for itself great popularity, for the reasons that its author combines a rich experience in hospital and private practice with an ability to express himself clearly and in such a way as to present facts in an attractive manner to those who are interested in diseases of the skin. The illustrations, which are exceedingly numerous, are unusually well executed, and in almost every instance produce a correct conception of the pathological process described. In other words, even the black-and-white illustrations aid the practitioner in reaching a correct diagnosis of the lesions present, and the text which deals with differential diagnosis does so in a satisfactory manner. The present edition does not contain many new articles, but shows that the author has carefully revised its pages. The book is perhaps the best in the English language for the student, the general practitioner of medicine, and the specialist.

ROENTGEN RAYS AND ELECTROTHERAPEUTICS. With Chapters on Radium and Phototherapy. By M. K. Kassabian, M.D. The J. B. Lippincott Company, Philadelphia, 1907.

This volume, which belongs to "Lippincott's New Medical Series," edited by Dr. Francis R. Packard, is intended to present clearly and concisely the more important facts pertaining to electrotherapeutics and Roentgen rays as well as radium. The book begins with a historical sketch of the rise of electricity and a discussion of its place in the medical curriculum. Then follows a description of the nature and properties of magnetism or electricity, and of the sources of electrical energy. After this the various types of electricity, such as static, galvanic, and faradic electricity, are considered. The fifth chapter considers cataphoric methods and hydroelectric baths, which is followed by other chapters upon electrodiagnosis, electrophysiology, and electrotherapeutics, in which the various diseases which are supposed to be benefited by electricity are discussed. The second part of the book deals with the Roentgen Rays and Diagnosis, and contains a historical introduction, followed by a discussion of the studies of the cathode and the Roentgen rays with the means of

erecting and using the apparatus, and with skiagraphy and photography. Then follow other chapters upon the clinical application of Roentgen rays in diagnosis, in treatment, and in forensic medicine. The third part of the book deals with radiotherapy and radium along lines similar to those just quoted. It will be seen, therefore, that the book is a much more exhaustive one than many of the smaller manuals which have recently been published. We look with considerable interest to discover whether the author is as much of a therapeutic optimist in regard to the value of electricity as many of his colaborers. We are glad to see that while he fully recognizes its valuable influence in many conditions he rarely claims for it the extraordinary or mystical effects which some enthusiasts think they see follow its use. There is probably no department of therapeutics of which so little is known and which is so much abused as this one, and Dr. Kassabian's work is well qualified to place it upon a better basis.

A Text-book of Physiology. By Isaac Ott, M.D. Second Edition, Revised. The F. A. Davis Company, Philadelphia, 1907.

The second edition of Dr. Ott's book upon Physiology has been increased in size by the addition of two hundred and fifty pages, which means therefore that a large amount of new material has been added to the text of the first edition. Not only this, but 250 additional illustrations have been introduced. Dr. Ott has been for so many years an active original investigator in the fields of physiology that the book bears on many of its pages evidences of the studies which he has made, and therefore it is in every sense of the word "Ott's Physiology." It suffers in comparison with a number of other works upon the same subject in its rather brief description of some important details, but chiefly in its illustrations, the execution of which is far behind that commonly found in standard text-books of the present day. For students who have the privilege of following Dr. Ott's lectures it will doubtless prove of value, but we doubt whether it will be employed in other schools in the place of other works which have been longer before the medical public, and which are perhaps better adapted to the needs of the average undergraduate.

The Essentials of Medical Gynecology. By A. F. Stephens, M.D. The Scudder Co., Cincinnati, 1907.

This volume is designed to represent the so-called eclectic or specific practice of medicine in the treatment of disease with special reference to the ailments of women. Where disease can be relieved by surgical measures alone the author states that he has frankly admitted this fact, and not attempted to give medicinal measures. But on the other hand he is firmly convinced that a good many drugs which are commonly used by eclectic practitioners possess a great influence upon these portions of the female anatomy. Many useful hints in regard to local applications in internal treatment are given. So, too, the book breathes an optimism in regard to the possibilities of local systemic treatment which probably is not felt by many other gynecologists of experience. With the statement that no definite results have attended the attempt to find the specific organism of syphilis in the tissues modern pathologists will probably disagree, and the space which is devoted to the treatment of syphilis in women seems to us quite inadequate, covering as it does less than four pages. Furthermore, the remedies mentioned are certainly inadequate in the majority of cases to control the inroads of the disease. Perhaps no statement will find such adverse criticism as the assertion that the mercurial treatment, upon which the great majority of physicians depend, is responsible for many of the frightful results observed in syphilis. Dr. Stephens also states that he has never had occasion to use mercurial treatment in a quarter of a century, and that he has long had cause to regret its use. The quotations of these statements in regard to the treatment of syphilis make, perhaps, an erroneous impression of the methods recommended in other portions of the book, since they are so antagonistic to the belief of all practitioners

of large experience as to give the impression that the rest of the text must be heterodox. As a matter of fact the book contains some valuable suggestions.

A TEXT-BOOK OF PATHOLOGY. By Francis Delafield, M.D., LL.D., and T. Mitchell Prudden, M.D., LL.D. Eighth Edition. Octavo. Illustrated. William Wood & Company, New York, 1907. Price $5.50 net.

Practitioners, teachers of medicine, and students of medicine, alike, will rejoice to learn that this standard work upon Pathology has once more appeared in its eighth edition. Since the first edition was published it has been regarded as one of the best books ever written by American pathologists. Indeed, it may be well said that it is one of the best books that have ever been written in any department of medical science either in this country or abroad. The authors, particularly Dr. Delafield, have had sufficient clinical experience to impress them with the importance of embodying in its pages information which will prove of value at the bedside as well as in the post-mortem room, and their large experience in both of these places has provided them with a richness of material which has resulted in the presentation of most excellent illustrations, both in black and white and in color. The practitioner and the student who uses this book side by side with one of the standard works upon practice will not only keep himself abreast of the times, but will also improve his ability to properly care for those that are ill with each reference that he may make to its pages. It is decidedly one of the most valuable additions which can be made to a medical library.

A TEXT-BOOK FOR THE PRACTICE OF MEDICINE FOR STUDENTS AND PRACTITIONERS. By James Magoffin French, A.M., M.D. Third Edition, Revised. Illustrated. William Wood & Company, New York, 1907.

The present edition, we are told in the preface, has been largely rewritten and every page revised. Certain parts which had been condensed for the purpose of saving space have been amplified, and this has served to increase the volume more than one-half in size. A number of new illustrations have been introduced. The weights and measures of drugs which are used for medicinal purposes are given in both the metric and English systems, and the temperatures in the Fahrenheit and Celsus scales. It is sad to record the fact that Dr. French died just as this third edition, of what may be considered his chief life-work, made its appearance. The volume as it stands to-day provides a complete story and study of the various diseases which are commonly discussed in books of this character, and many of the colored plates and black-and-white drawings which it contains add very materially to the value of the text. The fact that the book has reached its third edition within four years from the time of its first appearance shows that its value has been appreciated.

IMMUNO-CHEMISTRY. By Svante Arrhenius. The Macmillan Co., New York, 1907. Price $1.60.

As its title indicates this book deals with the application of the principles of physiological chemistry to the study of biological antibodies, and is a summary of six lectures on "Immunity Reactions" delivered at the University of California during the summer session of 1904. The book is dated by its author from Stockholm, Sweden, October, 1906, and therefore it is not fair to expect it to contain some of the more recent contributions which have been made to this subject, a subject which has now become so important that it is of extreme interest not only to the laboratory worker but to the practitioner as well. The present volume cannot be considered in any sense a brief summary of the subject at issue. It is quite complete enough to provide the original investigator with a large amount of fundamental knowledge which it is essential for him to possess.

THE CHEMISTRY OF COMMERCE. By Robert Kennedy Duncan. Harper Brothers, New York, 1907.

As its title indicates the design of this book is to present a simple interpretation of new chemistry in its relation to modern industry; or, in other words, it is designed to educate the laity in regard to many of the

applications of modern science to the industries of to-day. After an opening introductory chapter there is one upon Catalysis; another upon the problem of the fixation of nitrogen; while the fourth deals with rare earths and some of their applications. The fifth chapter is one of the most interesting in the book and deals with high temperatures and modern industries; the sixth with modern chemistry in glass-making; the seventh with industrial alcohol; the eighth with floral perfumes, actual and synthetic; the ninth with the making of medicines synthetic in nature; the tenth is entitled "The New Microbe Inoculation;" the eleventh deals with cellulose; and the twelfth is devoted to the subject of industrial fellowship, "a scheme by which a manufacturer may solve his problems." A considerable number of illustrations are found in the volume, and it is well worth a careful perusal by those who wish to obtain information along the lines which we have described.

THE CLIMATIC TREATMENT OF CHILDREN. By Frederick L. Wachenheim, M.D. The Rebman Co., New York, 1907. Price $2.50.

We confess that we had not supposed that there was much room in medical literature for a book which was devoted to the climatic treatment of children, because most of the books upon Climatology include information which is equally valuable whether the patient be full-grown or a youth. That there is urgent need in this country for better provision for the poorer classes in regard to climatotherapy is, of course, well known. Evil conditions exist in every large city, and sometimes in country districts as well.

Much information is given in this volume in regard to special localities, as to their temperature, humidity, and geographical position. One of the most interesting diagrams is that showing the "advance of spring," illustrating very well how certain sections in New Jersey, which geographically are on the same level as parts of Pennsylvania and Ohio, feel the approach of warm weather a considerable period of time before points which are further inland. As a contribution to pediatric literature the book is useful and valuable.

A MANUAL OF THE PRACTICE OF MEDICINE. Prepared Especially for Students. By A. A. Stevens, A.M., M.D. Eighth Edition, Revised. Illustrated. W. B. Saunders Co., Philadelphia, 1907.

This small handbook, prepared by a successful teacher of pathology and medicine, covers less than 600 pages, and has reached its eighth edition in fifteen years. It is considerably larger than the average quiz-compend, and far smaller than any of the standard works upon medicine which are commonly employed as text-books. Special attention is given in its pages to the subject of diagnosis and treatment. It is, in other words, a brief résumé of the subject of which it treats, but it is too brief to be employed for the purpose of carefully studying the subject of disease. It is sufficient to provide the student with a most excellent summary from which he may refresh his memory about examination time. The teaching is safe, correct, and clearly stated.

MATERIA MEDICA AND PHARMACY. By Reynold Webb Wilcox, M.D., LL.D. Seventh Edition. P. Blakiston's Son & Company, Philadelphia, 1907.

We have already called attention to the companion volume upon Pharmacology and Therapeutics published by this author. This smaller volume is designed apparently for students during the early part of their training. It contains comparatively little information as to the therapeutics of the drugs named, and deals considerably with their derivation, characteristics, and the preparations which are made from them. It is a first-rate handbook for the class of students for which it has been prepared.

A HANDBOOK OF CUTANEOUS THERAPEUTICS. For the Use of General Practitioners. By W. A. Hardaway, M.D., and Joseph Grindon, Ph.B., M.D. Lea Bros. & Co., Philadelphia, 1907.

Dr. Hardaway is so well known to the profession as the author of a manual of skin diseases that anything that he may say of these conditions is necessarily of interest. The present volume is devoted almost entirely to the subject of treatment, and its pages contain a multitude of prescriptions which illustrate the methods which the authors employ in their own practice. A

sufficient amount of text precedes the discussion of the treatment of each disease to aid in the diagnosis and in the determination of the stage which the disease has reached. If there is one subject about which general practitioners are hazy it is the therapy of skin lesions, and we believe that this book will at once prove popular and useful to the general practitioner, and probably to the dermatological specialist as well.

KIRKES' HANDBOOK OF PHYSIOLOGY. Revised and Rewritten. By Charles Wilson Greene, A.M., Ph.D. Sixth American Edition. Copiously Illustrated. William Wood & Co., New York, 1907.

Kirkes' Physiology, for many years the standard work upon this subject amongst English and American students, has been repeatedly revised by a considerable number of editors, and now bears scarcely any resemblance to the volume which students used twenty-five or thirty years ago. The present edition has, in many respects, been brought up to date, but in some parts we think that additional emendation and revision is required.

THE LIFE OF NATHAN SMITH DAVIS, A.M., LL.D. By I. A. Danforth, A.M., M.D. Illustrated. The Cleveland Press, Chicago, 1907.

Dr. N. S. Davis, Senior, for many years occupied a commanding position in the American medical profession. He was, as is known to many of our readers, a stalwart opponent of the employment of alcohol as a drug and as a stimulant. Fearless in the expression of his opinion, and active in the practice of his profession, he at all times commanded attention and respect, and this volume is designed by one of his colleagues to perpetuate his memory.

PRACTITIONER'S VISITING LIST FOR 1908. Lea Brothers & Company, Philadelphia, 1907. Price $1.25; with Thumb Index, $1.50.

We have so frequently referred to this Visiting List in terms of praise in previous years that little remains but to call the attention of our readers to the fact that it has been published once more with the dates arranged for the coming year. It is an excellent form in which a physician may keep a record of his daily professional work. It will be recalled that it appears in four styles: the Weekly, dated, for 30 patients; the Monthly, undated, for 120 patients per month; the Perpetual, undated, for 30 patients weekly; and undated for 60 patients.

THE MEDICAL RECORD VISITING LIST FOR 1908. William Wood & Company, New York, 1907. Price $1.25.

This list is another one of those which have been popular with active practitioners for many years, and is well known to many of our readers. It is conveniently arranged and contains much useful information in its opening pages.

A PRACTICAL TREATISE ON FRACTURES AND DISLOCATIONS. By Lewis A. Stimson, B.A., M.D., LL.D. (Yale). Fifth Edition, Revised and Enlarged. Illustrated. Lea Brothers & Co., New York and Philadelphia, 1907.

The repeated calls for new editions of Stimson's admirable work sufficiently attest the appreciation with which the profession has received a monograph based not only on scholarly research, but on wide clinical experience. The comparatively recent additions to the knowledge of fracture, incident to perfected technique in the taking of *x*-ray pictures, will be found embodied in the text of this book, together with a fuller knowledge of the epiphyses and their bearing upon fractures near the joints. The work is copiously illustrated with woodcuts and plates, many of them from the *x*-ray laboratory.

Although on general principles Stimson commends the treatment of fracture, the deformity of which cannot be corrected by manipulation and splinting, by open operation, the details of such operation scarcely receive the careful attention which might be expected from one who is an enthusiastic advocate, nor are found pictured the implements which make such operations comparatively easy.

In considering fractures of the lower end of the humerus, particularly the low supracondyloid variety, he notes that the injuries are often attended, on recovery, by cubitus varus. This he believes is due to the action

of gravity when the forearm is supported across the front of the body. Hence in this fracture he advises recumbency with the elbow at a right angle and the forearm vertical, stating that this always in his experience has prevented subsequent deformity. The confinement to bed he does not insist on for more than a week. Full flexion, he states, can itself produce an angular displacement, which he instances by an *x*-ray picture.

In the discussion of the treatment of fracture of the neck of the femur the method of Whitman—*i.e.*, forced abduction and plaster splint—is mentioned only to be condemned, whilst that advocated by Ruth, combined longitudinal and lateral traction, is not even mentioned. Operative methods receive almost unqualified condemnation. In fracture of the shaft of the femur Stimson prefers vertical extension in children, Buck's extension when the injury is encountered in the adult.

In the treatment of fractured patella Stimson advises the operative treatment for the skilled surgeon. For those not properly equipped either with experience or the material and the environment essential to cleanly work he advocates posterior splint with straps. Stimson cites over 200 cases of open incision and fibroperiosteal suture with recovery without accident, and with close union except in one case, in which there was slight superficial suppuration which did no harm.

In the section devoted to dislocation is found an extremely interesting chapter upon vertebral displacements and that of the occiput and atlas.

The few paragraphs devoted to dislocation of the semilunar cartilages are not entirely satisfactory in so far as the treatment is concerned, nor have the results of operative treatment been uniformly good. This in severe cases gives relief, but does not insure a strong joint.

This book is likely to be of service not only to the general practitioner, but to the hospital surgeon, who is constantly called upon to treat fractures.

DISEASES OF THE GENITO-URINARY ORGANS AND THE KIDNEY. By Robert H. Greene, M.D., and Harlow Brooks, M.D. Illustrated. W. B. Saunders Company, Philadelphia and London.

This book, printed on excellent paper, with the clear type and admirable illustrations characteristic of Saunders's productions, is designed to present a discussion of the more important pathological conditions of the genito-urinary tract from the standpoint of the general practitioner and surgeon. It therefore devotes the greatest amount of space to the description of conditions and methods which the authors deem of greatest importance, and which being of recent development they presume to be less known to the practitioner. The work, being jointly by a physician and surgeon, includes in its scope Bright's disease in both its acute and chronic form. The catheterizing cystoscopes they prefer are those modified by F. Tilden Brown and by Bierhof. The phloridzin and methyl blue tests for kidney permeability are given in detail. There is a brief but very excellent chapter upon examination of the urine, together with some admirable illustrations.

Kalish contributes a chapter upon "The Ocular Manifestations of Renal Diseases."

Among the methods of diagnosis to which the authors attach special value is that of massage or making pressure over the kidney and along the course of the ureter.

Though this book does not pretend to cover the whole domain of genito-urinary surgery, the subjects which it discusses are treated with a rightness of judgment which implies large clinical experience and thorough familiarity with the work of those most skilled in this field of knowledge.

THE PRINCIPLES AND PRACTICE OF MODERN SURGERY. By Roswell Park, A.M., M.D., LL.D. (Yale). Illustrated. Lea Brothers & Co., Philadelphia and New York, 1907.

This work, which succeeds the Treatise on Surgery by American authors, covers in one volume of a little over one thousand pages the entire realm of surgery, and does this so well, with such a clear view of proportion and so admirable a perception of all

that is best and likely to be lasting in modern surgical progress, that the book is assured of a wide popularity. The illustrations are excellent, copious, and helpful to the text; the classification a simple and serviceable one; the pathology beyond reproach.

As properly lying in the domain of general surgery Park includes autoinfection, chancroid, gonorrhea, autointoxication, anesthesia, and anesthetics.

After sections upon surgical affections of the tissues and tissue systems, the latter part of the work is devoted to regional surgery.

Because of the great authority Park's name carries in research work, his views in regard to the treatment of tetanus by antitoxin must be received with some surprise. He states specifically: "It is safe to say that the former great mortality rate of tetanus has been reduced at least 50 per cent by its use, and further reduction can be effected by its early and prolonged use." He advocates an injection of the antitoxin into the spinal canal and along some of the nerve trunks.

It is the opinion of the majority of men who have carefully studied the literature of antitoxin that though this remedy may be serviceable as a preventive, its application after the disease has once developed is futile.

Park's work is likely to remain as the best instance of scientific condensation and clear expression to be found in surgical literature.

A Text-book of Clinical Anatomy for Students and Practitioners. By Daniel N. Eisendrath, A.B., M.D. Second Edition, Thoroughly Revised. W. B. Saunders Co., Philadelphia and London, 1907.

This book is designed to enable the student and practitioner to use in his daily work the descriptive anatomy which after having laboriously acquired by one or two years of lectures, the memorizing of text-books and work in the dissecting room, he forgets almost as rapidly because he has never been taught to make of his fundamental knowledge the practical application. It is obvious from the scheme and arrangement of the book that the system has been compiled by a practical teacher, who has had the keenness of insight and clinical experience to pick from the vast amount of material at his hand such facts as are likely to be most serviceable to the practitioner of medicine and surgery.

The illustrations are admirable, the text marked by the clearness of expression which is characteristic of the teacher, and the book-making quite up to the high standard established by the firm of Saunders. This is a book which not only students and practitioners of medicine but also the specialist in surgery will find distinctly helpful.

Five Hundred Surgical Suggestions. By Walter M. Brickner, B.S., M.D., and Eli Moschcowitz, A.B., M.D. Second Series. Surgery Publishing Company, New York, 1907.

The second edition of this book issued so shortly after the first sufficiently attests the appreciation with which the profession at large has received a series of practical observations based upon a clinical experience so wide as to include cases not usually encountered in the routine of professional work. Even those most versed in the art of surgery and medicine can glance over these pages with profit, since there is scarcely one which will not be found to contain a suggestion of value.

Modern Methods of Diagnosis in Urinary Surgery. By Edward Deansley, M.D., B.Sc. Lond., F.R.C.S. London: H. K. Lewis, 1907.

Deansley states that "if we except the use of a few instruments devised for facilitating diagnosis and certain operations, there is nothing in genito-urinary surgery which distinguishes it from any other regional surgery. It requires, like all surgery, a sound knowledge of anatomy and pathology, some mechanical aptitude and manipulative skill, rigorous attention to the details of asepsis, and, what was practiced by all the great surgeons of the past and is now sometimes neglected, the habit of cutting cleanly and precisely and avoiding unnecessary handling and blunt dissection. Armed with these elementary requirements and with a prac-

tical knowledge of a few special instruments, any competent general surgeon may practice genito-urinary surgery by the same methods and on the same principles as he employs in the rest of his work."

It is from this standpoint that the book has been written.

The first chapter is devoted to Interpretation of Urinary Symptoms, and is an excellent condensation of the commonly accepted views on this topic.

The second chapter is devoted to Abnormal Conditions of the Urine; the third chapter to Physical Examination of the Patient and of the Urinary Organs. The cystoscope and the radiograph are considered in detail, as are also the Cathelin and Luys separators.

As a readable book this work is to be commended; as even a brief outline of modern methods of diagnosis in urinary surgery it leaves much to be desired.

CORRESPONDENCE.

LONDON LETTER.

BY G. F. STILL, M.D., F.R.C.P.

Once more the medical and other scientific societies are in full swing, and at the beginning of this month the medical schools also entered upon a year of fresh activity. The work of the new Royal Society of Medicine, the long-projected and long-deferred scheme which a former generation of our profession tried in vain to accomplish, has now begun in earnest. The building which for many years has served as the home of the Royal Medical and Chirurgical Society at 20 Hanover Square has been undergoing structural alterations during the summer, so that the new society has a much more ample accommodation for its library than had the former institution; and indeed the library deserves it, for it shares with that of the Royal College of Surgeons the distinction of being the finest medical library in the United Kingdom. The various sections have already begun to hold their meetings. The medical section has taken for its first discussion the subject of pneumonia: the opening remarks were by Dr. Hector Mackenzie. Dr. Foulerton contributed some interesting observations on the question of serum treatment for this disease, and so many other speakers wished to take part in the debate that it was necessary to postpone the discussion for continuation at the next meeting. Both at this section and at the surgical section, where the diagnosis of abdominal diseases by the help of the Roentgen rays was under discussion, the attendances were so large that the accommodation of the hall was taxed considerably—an agreeable change from the dreary solitudes which too often greeted a valuable discourse at the old Medico-Chirurgical Society.

Among the events of the month must be mentioned the conversazione which has just been held in the new Out-patient and Special Department Block which has recently been completed at St. Bartholomew's Hospital. The foundation-stone of this was laid by His Majesty the King in July, 1904, and although the building was formally opened by the Prince of Wales three months ago, a more public inauguration was thought desirable and was carried out by this conversazione, to which no less than three thousand persons were invited. Lord Ludlow, treasurer of the hospital, received the guests, amongst whom were the Lord Mayor of London, Sir William Treloar, whose name has been so prominently before the public in connection with his effort to found an institution for the reception of poor crippled children, and with him was the Lady Mayoress. Sir Thomas Smith and Sir William Church, although no longer active members of the hospital staff, were present, and, of course, the present staff.

The hall in which the guests were received is on less festive occasions the waiting-hall for patients, and around this hall, which is capable of accommodating no less than 850 patients, are twenty-one consulting rooms. Every one who is familiar with hospital waiting-rooms is familiar also with the unwholesome, dirt-laden atmosphere of these rooms, but this vast waiting-hall is so ventilated that the air in it will be changed ten times every hour. In this hall a string band of the First Life Guards discoursed sweet music, while in a clinical theater two members of the staff at different times during the evening discoursed popular lectures. Mr. D'Arcy Power, who is a fellow of the Society of Antiquaries in addition to his surgical distinctions, and who is well known as an authority on the biography of famous members of the medical profession in past centuries, delivered a brief lecture on "Some Past Worthies of the Surgical Staff," and Dr. F. W. Andrews talked of "Medicine and Super-medicine." I was not present at this lecture, and consequently offer no solution of the mysteries of "super-medicine." Demonstrations of a more or less popular nature were given in various departments of the new building: one which attracted perhaps the lion's share of attention was that given by Dr. H. Walsham in the *x*-ray department, where the laity were much impressed by viewing the beating of the heart by means of the Roentgen rays. Another department which came in for a goodly share of attention was the admirable new hospital kitchen, but whether it was the excellent soup that was served there, or whether it was the fine equipment with the most modern gas and steam-cooking apparatus which proved so attractive, remains uncertain. The proceedings lasted until a very late hour—indeed, many of the visitors could hardly have reached their homes until the small hours of the morning.

Professor Osler was amongst the speakers at the opening of the Tuberculosis Exhibition at Dublin this month and extolled the climate of Ireland for consumptives. He said that fresh air, good food, good houses, and hope were more essential for the cure of consumption than sunshine. This exhibition, which has for its object the education of the public as to the dangers and avoidance of tuberculosis, was opened by Lord Aberdeen, the Lord-Lieutenant of Ireland, and Mr. Birrell, who has made himself notorious already in connection with education, made some remarks on the diminution in the practice of spitting in public vehicles and other places. Sir Ray Lankester has been drawing the attention of the laity to this evil lately, especially in connection with our new railway tubes, where, he says, the absence of sunlight, which might help to render bacteria innocuous, makes spitting particularly dangerous.

The principal of the University of London, Sir Arthur Rücker, is about to retire from this important post. He has held many distinguished offices in scientific bodies: at one time he was professor of physics at the Royal College of Science in London, he was secretary of the Royal Society before the late Sir Michael Foster, and in 1901 he was president of the British Association; he has been principal of the London University since that year.

The annual Gresham lectures are to be delivered this month by Dr. F. M. Sandwith, who was formerly at Cairo, and was consulting physician to the Khedive. He is this year Gresham professor of medicine, a curious office and no easy one to fill satisfactorily, for the professor is expected to deliver a scientific lecture of some value and to adapt it to the lay intelligence, for his discourse is open free to the general public. Professor Sandwith has chosen as his main theme the control of the milk-supply, an excellent subject for the education of public opinion.

Yet another international *omnium gatherum!* It seems that not content with an International Congress of Hygiene, a ditto of School Hygiene, a ditto of Medicine, and a ditto of Gouttes de Lait, we are now to have an International Society of Tropical Medicine. Well, if they do nothing else, these gatherings promote international good-feeling, and no doubt will play their part, perhaps hardly less certainly than a Hague Conference, in preventing European war.

But it is good that the boundaries of race and country should be disregarded by medicine and by all true science, for nation can help nation to no small degree in scientific progress, and it is well that the first president of the new international society is to be Sir Patrick Manson, an author on tropical diseases whose fame is indeed international. Sir Patrick is already president of the Society of Tropical Medicine and Hygiene in London, and presided this month at one of its meetings, at which an interesting paper was read by Dr. A. R. Cook upon sleeping sickness as seen in Uganda. The treatment by atoxyl was described as brilliantly effectual: it is administered by hypodermic injection in doses of 2 Cc. of a saturated (that is, a 22-per-cent) solution of atoxyl in distilled water; this is given every day or every alternate day until seven or eight injections have been given. The result is rapid improvement in the patient's condition and the disappearance of the trypanosome from the cervical glands, as shown by exploratory puncture of these glands, which are enlarged.

At the first meeting of the new Pathological Section of the Royal Society of Medicine, the new president, Mr. S. G. Shattock, took the chair; and the section is to be congratulated on its choice, for no one has done more for the old Pathological Society than Mr. Shattock, whose wide knowledge of the problems of modern pathology, and especially experimental pathology, will be of the greatest value in his new post.

Professor Osler delivered a most inspiriting address at the Medical Society of University College Hospital, on "The Place of a Medical Society in the Education of the Student." He indicated the lines upon which discussions might best be conducted, and gave one golden piece of advice as to the reading of papers, namely, that they should be brief, a piece of wisdom disregarded, alas! not only by junior students, but too often by senior members of the profession at many of our London societies.

The Harveian oration at the Royal College of Physicians was delivered this month by Dr. Frederick Taylor, who took the opportunity to insist upon the value of vivisection in the advance of medical science. After the oration came the presentation of the Baly medal, which is awarded every two years to the person who is "deemed to have most distinguished himself in the science of physiology." In 1905 it was awarded to Professor Pawlow; this year Professor Starling, the Jodrell Professor of Physiology at University College, was the recipient.

A HOMEOPATHIC VIEW OF CACTUS GRANDIFLORUS.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: Your editorial on "The Lack of Therapeutic Value of Cactus Grandiflorus" in the November 15 number is misleading, and its conclusions are erroneous.

Cactus is decidedly active when a proper preparation is employed. The tincture should be made of the fresh flowers and fresh young twigs, a moist magma containing 100 Gm. solids, and plant moisture reduced to 567 Cc.; add strong alcohol, 470 Cc., to make 1000 Cc. of tincture.

With a tincture so made and in minute doses I have repeatedly produced in the same patient (a case of tachycardia of long standing) a sense of constriction of the heart, as if an iron band prevented its normal movement, acute pains, and stitches in the heart. These symptoms have been so marked that the patient has several times asked me not to give her the remedy that binds her heart.

Such symptoms of irritability, hyperesthesia, neuralgia, and heart spasm have been frequently caused and as frequently relieved by cactus in minute dosage by members of the homeopathic and eclectic schools, and the article in the THERAPEUTIC GAZETTE does not at all coincide with such experiences.

It may perhaps be necessary for me to state that I have never administered cactus in combination with any other remedy.

Very truly yours,

T. H. CARMICHAEL.

PHILADELPHIA, Nov. 21, 1907.

INDEX TO VOLUME XXIII, THIRD SERIES.

(WHOLE SERIES, VOLUME XXXI.)

Abdominal belts in the treatment of whooping-cough 483
operations, drainage after..... 424
section for trauma of the uterus..... 61
—gridiron incision 813
tumors in children 57
wounds, penetrating 656
Abortion caused by x-rays..... 429
Abscess of the mesenteric lymph glands.... 730
Accidental hemorrhage, some points in the diagnosis and treatment of..... 62
Accidents due to chloroform inhalation..... 198
following thoracentesis 543
Accuracy in medicine..... 860
Acidified milk in infant feeding..... 476
Actinomycosis in pregnancy..... 133
of the cheek cured by iodide of potassium 115
Acute colitis and ulcerative colitis..... 868
infections, the importance of treating the pharynx and tonsils in the early stages of some 95
obstruction due to appendicitis..... 736
Adenitis, tubercular—treatment by x-rays.. 131
Administration of anesthetics facilitated by tubation of the pharynx..... 438
of creosote 256
of ether, a primer on the..... 844
Adrenalin and cocaine in the larynx..... 568
and novocaine for enucleation of the eye 707
chloride in the treatment of rattlesnake-bite 107
digitalis, and strophanthus, the influence of upon the velocity of the blood current 490
effects of on the blood-vessels..... 566
external use of in neuralgia, neuritis, and reflex or referred pain..... 293
in gastric ulcer 637
in nasal troubles 171
in osteomalacia 636
in plague, further observations on the use of 253
in purpura 711
irrigations in gastrorrhagia..... 413
the use of during ether anesthesia..... 490
Alcohol injections in the treatment of neuralgias 396
of in nervous affections..... 46
question, the 389
the external use of in surgery..... 28
the physiological effect of on the animal body 401
the value of 745
—what is its influence on hepatic glycogen? 183
Alopecia, syphilitic 502
Amenorrhea and dysmenorrhea, the stem pessary for 472
Amputation above the knee, Gritti's..... 667
at the hip-joint 362
of the arm, useful stump after..... 180
of the breast—after-treatment..... 813
Amyl nitrite in hemoptysis..... 554
Anatomic treatment of fractures of the femoral neck 145
Anders, James M.: Uremia..... 772
Anemia, severe—transfusion in..... 801
Anesthesia and methods producing it..... 240
by intradural injections..... 136
by the drop method..... 144
in the treatment of carcinoma..... 131
—prevention of vomiting..... 360
spinal: its advantages and disadvantages 123
Anesthetic methods, notes on some..... 40
Anesthetics, some facts as to..... 855
some recent research work on..... 717
used in general surgery..... 604
Anesthetization for operations on the urinary organs 426
Aneurism of the neck, arterial venous..... 63
thoracic 570
Angeiorrhaphy, end-to-end arteriovenous... 436
Angina pectoris 51
the nature and treatment of... 52
Angiomata and nevi—electric treatment... 360
Ankle dislocation 721
Anthrax, treatment of..... 207
Antipyrin as a sedative in some of the common disorders of infancy and childhood 640
Antisepsis, intestinal 258
Antiseptic douches harmful in puerperal infection 423
properties of tobacco smoke..... 694
Antiseptics, intestinal 108
Antitoxin—can it prevent postdiphtheric paralysis, given before infection as a prophylactic? 802
in the treatment of diphtheria.....117, 558
of hemophilia 813
the oral administration of..... 29
Antivivisectionist propaganda in England.. 290
Anuria, reflex, caused by cystoscopy..... 67
Aortic disease 625
Apoplexy and its treatment..... 548
notes on the treatment of..... 808
Appendicectomy, the trend of the times in.. 60
Appendicitis, acute obstruction due to..... 736
suppurative—empyema and abscess of the lung as sequels of 660
simulating sacroiliac disease and sciatica 673
the diagnosis of 607
—when to operate 578
Appleman, Leighton F.: The External Inflammatory Diseases of the Eye..... 226
Argyrol, silver nitrate, and protargol, the comparative efficiency of..... 411
solutions in the treatment of purulent ophthalmia 475
Argyrosis, including a preliminary note on the action of silver salts..... 408
Arhovin, the therapeutic value of..... 163
Arrhythmia caused by digitalis..... 705
Arterial hypertension, the treatment of.... 400
pressure, supernormal—some notes on the control of..... 633
sclerosis 549
tension, high—the control of..... 539
venous aneurism of the neck..... 63
Arteriosclerosis, the treatment of..... 703
Arthritis deformans, the treatment of..... 159
gonorrheal, in children..... 126
—the treatment of 338
tubercular—technique of intra-articular injections 134
Articular lesions caused by the influenzal virus 507
rheumatism, acute—a clinical study of 210 cases 265
Artificial feeding of infants in private practice 87
immunity to carcinoma..... 425
Aseptic intestinal suture 666
operative technique 329
Asiatic cholera: its prevention and treatment 873
Asphyxia neonatorum, the use of oxygen in 120
Association of Physicians of Great Britain and Ireland—new society in London..... 519
Asthma, fuming inhalations in..... 701
in infants and children..... 480
Atlas dislocation, rotary..... 439
Atoxyl 806
in the treatment of sleeping sickness.. 900
Atrophic rhinitis 410
Atropine and strychnine in the treatment of the morphine habit 695
Aural and laryngeal complications of typhoid fever 380
Avulsion of the tuberosity of the tibia..... 817

Babcock, W. Wayne: A Summary of Certain Forms of Surgical Practice (from the Samaritan Hospital Service) 604
Bacterial infections of the digestive tract and the intoxications arising therefrom 569
vaccines and opsonins 503
a review of the..... 24
Baldness, common—the cause of..... 431
the treatment of..... 406
Banti's disease and splenectomy..... 59
Bassler, Anthony: Prophylactic Measures Guarding Against the Development of Landau Cases of Visceroptosis..... 597
Benign genital tumors—treatment during pregnancy 133
Biddle, J. C.: The Treatment of Burns in the State Hospital for Injured, Fountain Springs, Pa. 378
Bier's congestion treatment..... 360
suction apparatus in the treatment of mastitis 883
Biliary system, drainage in operations upon the 722
tract, the general principles of treatment in infections of the..... 194
Bilirubin, the toxicity of..... 17
Blackburn, A. E.: Hot and Cold Applications in Medicine 457
Blackwater fever due to administration of quinine 48
Bladder and kidney tuberculosis..... 578
tuberculosis—treatment 577
Bleeding in head operations, control of..... 206
Blood current, the influence of digitalis, strophanthus, and adrenalin upon the velocity of the 490
pressure, the clinical significance of variations in 90
transfusion, direct 344
vessels, effects of adrenalin on the..... 566
surgery of the..... 129
Bloodless methods of artificial dilatation of the cervix uteri at full term..... 357
Bloody method of rapid dilatation..... 279
Bone and periosteal transplantation..... 609
Boyd, George M.: The Hygiene and Management of Pregnancy 77
Brachial plexus, paralysis of the—some observations on 430
Brain injury—indications for late operation 361
lesions—exploratory puncture 424
tumors—palliative operation 425
Brav, Aaron: Ocular Manifestations in Venereal Diseases 308
Breast amputation—after-treatment 813
Bright's disease, decapsulation for the cure of 760
newer ideas of the treatment of 266
Brometone in the treatment of epilepsy.... 43
Bronchiectasis, the treatment of..... 273
Bronchitis, chronic, of old people—the treatment of 414
Bronchus, foreign bodies in the..... 343
Bubonic plague, large mortality from in India 857
Bulkley, L. Duncan: Errors in the Diagnosis and Treatment of Diseases of the Skin—Dont's in Dermatology,..... 678
Practical Points in the Diagnosis and Treatment of Diseases of the Skin... 828
Burns and scalds, the treatment of employed in the Pottsville Hospital.. 379
treatment of 702
the value of picric acid in the treatment of 629
treated with carbolic acid..... 560
treatment of 369, 373, 376
of at Sheltering Arms Hospital, Hansford, W. Va..... 377
of in the State Hospital for Injured, Fountain Springs, Pa. 378
Buttermilk as an infant food..... 647

Cactus grandiflorus, a homeopathic view of. 900
the lack of therapeutic value of. 789
Calcium salts as cardiac tonics in pneumonia and heart disease 388, 637
Can a specific disease be aborted?..... 245
Cancer, inoperable—methylene blue in the treatment of 55
—methylthionine hydrochloride in 122
mammary—excision of 584
of the breast..... 541
of the lip—radical operation..... 466
of the rectum, early recognition of and treatment 276
Cancer of the stomach, early diagnosis of... 32
the approaching conquest of..... 470
the interlude of..... 431
the trypsin treatment of.....261, 661
treatment of 99
with pancreatic extract..... 812
trypsin treatment of—report on the.... 494
Cannaday, John Egerton: Aseptic Operative Technique 329
Treatment of Burns at Sheltering Arms Hospital, Hansford, W. Va..... 377
Carbolic acid 560
gangrene 541
injections in the treatment of hemorrhoids 812
Carbuncles treated with carbolic acid..... 560
Carcinoma—artificial immunity 425
—experimental production 132
gastric—bacteriologic diagnosis 338
—the operative indication in..... 699
—is there an immunity?..... 133
of the rectum—operative technique.... 654
—treatment by anesthesia 131
—unexpected recoveries 814
Cardiac and renal disease, obesity, etc., the dechloridation treatment in..... 494
degeneration apart from valvular disease, the treatment of..... 562
dilatation, the treatment of..... 871
tonics, some considerations in the use of 867
Carleton, Henry Guy: External Use of Adrenalin in Neuralgia, Neuritis, and Reflex or Referred Pain..... 293
Castration in tuberculosis of the testicle.... 207
Catarrhal cholangitis and its congeners, an effective formula for 464
Catgut, preparation of.....496, 589
Causation and treatment of some headaches 404
Cecum, resection of the without preliminary false anus 275
Cerebellar abscess and pus in the labyrinth. 880
operations 655
Cerebral lesions, sudden: their diagnosis and treatment 803
Cerebrospinal fluid, pressure of the, and lumbar puncture in children..... 106
Cervical vertebra, successful reduction of dislocation of the..... 810
Chance, Burton: Iritis in General Disease.. 523
Chemistry of milk, practical application of the newer knowledge of the..... 483
Chest surgery 434
Children, hernia in..... 250
Children's underclothing in winter..... 116
Chimpanzee inoculated with syphilis..... 518
Chloral hydrate in the treatment of scarlet fever 216
routine doses of in the treatment of scarlet fever—an analysis of the kidney condition of 800 cases..... 1
in the treatment of eclampsia..... 221
Chloretone 538
and its uses, especially in chorea..... 644
Chloride of ethyl..... 571
as a general anesthetic..... 183
Chloroform inhalation, accidents due to.... 198
its indication and advantages..... 103
narcosis, the value of saline infusion in 696
shock—lessening by transfusion..... 816
oxygen anesthesia and pneumonia..... 358
Cholangitis, catarrhal, and its congeners—an effective formula for..... 464
Cholelithiasis—physical treatment 129
Cholemia in neurasthenia..... 17
Cholera, Asiatic: its prevention and treatment 873
some indications for the treatment of.. 712
Chorea, the use of chloretone in..... 644
Chronic bronchitis of old people, the treatment of 414
constipation 347
gastritis 707
ulcer of the stomach not cured by gastroenterostomy 500
valvular disease in children, the treatment of 267
Cinnamon oil in the treatment of influenza. 124
Circular anastomosis, the method of..... 666
Circulation in nephritis..... 762
Circulatory system, the effect of nicotine on the 706
Claims for damages against the medical profession in France 747
Climate in the treatment of tuberculosis..96, 269
Clinical examination of urine, the interfering action of drugs in the..... 352
significance of variations in blood-pressure ..... 90.

Cocaine and adrenalin in the larynx..... 568
Cod-liver oil in the treatment of rickets... 646
in tuberculosis, the value of... 859
Colchicum in the treatment of gout..... 397
Cold air versus cooked air..... 97
and hot applications in medicine..... 457
Colitis, acute and ulcerative..... 868
and tympany in typhoid, how to meet.. 876
mucomembranous 708
—the treatment of..... 540
Collargol injections in puerperal infection.. 357
Common baldness, the cause of..... 431
errors in the diet and general hygiene of children 407
sense and therapeutics 627
Comparative therapeutic value of organic and inorganic combinations of phosphorus 121
Complete dislocation of the fourth cervical vertebra followed by recovery..... 882
Compound dislocation of the wrist..... 133
Compressed-air (caisson) illness, the treatment of 563
Compresses left in the abdomen—prevention 813
Concussion of the spine..... 33
Congenital hypertrophy of the pylorus..... 367
Congestion treatment of Bier..... 360
Conjunctiva, affections of the—dwelling especially upon the drainage of lacrimal canals for treatment..... 566
Conjunctivitis, acute contagious 226
gonococcic—the treatment of, with special reference to the silver salts..... 4
gonorrheal—the treatment of..... 546
Constipation, chronic 347
—the treatment of..... 270
in infancy and childhood..... 807
Consumptives, the climate of Ireland for... 899
—where to send them..... 555
Contracted pelvis—best conduct to follow.. 207
induced labor as a conservative operation for..... 277
Contracture of the knee, treatment of in hip disease 135
Contributions to renal surgery..... 587
Control of high arterial tension..... 539
of supernormal arterial pressure, some notes on the 633
Convallaria, remarks upon the therapeutic action of 616
Cornea, vaccination of the..... 399
Coryza, the treatment of..... 170
Cost of flavor..... 711
Cranial fossa, posterior—operations on the. 510
Creosote in the treatment of pulmonary tuberculosis 865
the administration of 256
vapor, the inhalation of in the treatment of bronchiectasis..... 274
"Cry of the children"..... 368
Cure of psoriasis 259
Curettement with local anesthesia..... 287
Cyanosis, a peculiar case of..... 215
Cystopexy for falling of the bladder..... 663
Cystoscopy a cause of reflex anuria..... 67
Cystotomy, suprapubic, in children..... 206

Da Costa, J. Chalmers: The Surgery of Movable Kidney 766
Dangerous action of mercury on the kidney 416
Davis, Charles Gilbert: An Effective Formula for Catarrhal Cholangitis and its Congeners 464
Davis, Edward P.: The Medical Management of Pregnancy 73
Death through administration of anesthetics 291
Dechloridation treatment in cardiac and renal disease, obesity, etc..... 494
Delirium tremens, the treatment of..... 635
Dental caries in childhood..... 745
Dercum, F. X.: The Diagnosis and Treatment of Multiple Neuritis 10
Dermatology, don'ts in..... 686
De Schweinitz, G. E.: The Eye and the Kidney 778
The Treatment of Gonococcic Conjunctivitis, with Special Reference to the Silver Salts 4
Diabetes mellitus, the dietetic treatment of. 418
the treatment of..... 803
surgery in 733
Diabetic foods 477
Diagnosis of tumors—results of overconfidence and delay 342
Diarrhea, infantile, with special reference to the use of "lactated milk"..... 422
Diet and general hygiene of children, some common errors in the..... 407
of to-day, an address on the..... 215
Dietetic treatment of diabetes mellitus..... 418
of enterocolitis 35
Difficult labor following ventrofixation..... 206
Digestive tract, the common bacterial infections of the and the intoxications arising therefrom 569
Digitalis arrhythmia, the clinical significance of 705
as a heart tonic..... 44
in the treatment of aortic disease..... 625
in valvular disease of the heart..... 354
preparations 418
strophanthus, and adrenalin, the influence of upon the velocity of the blood current 490
Dilatation of the cervix uteri at full term, artificial—the bloodless methods of.. 357
of the stomach, acute—its relation to mesenteric obstruction of the duodenum 507
Diphtheria, antitoxin treatment of..... 117
epidemic at the Adirondack Cottage Sanitarium, a brief study of a..... 486
the treatment of..... 558
Directions for determining the opsonic index of the blood..... 173
Direct transfusion of blood..... 344
Disease disseminated by flies..... 469
personal equation in the treatment of.. 247
prevention of—the necessity for widespread measures in..... 467
Diseases of the eyelids—treatment by suction hyperemia 131
of the gall-bladder, medical treatment of 825
of the joints, present views on..... 279
of the kidneys as indications for the interruption of pregnancy 124
of the nasopharynx in infancy..... 796
of the skin, errors in the diagnosis and treatment of—don'ts in dermatology 678
practical points in the diagnosis and treatment of.... 828
that suggest special dangers in use of x-ray 197
Disinfectants and disinfection..... 402
Disinfection by formaldehyde..... 50
and potassium permanganate 487
of the mouth 98
Dislocation of the ankle..... 721
of the cervical vertebra, successful reduction of 810
of the semilunar bone 65
of the shoulder, habitual—treatment... 498
Dislocations and fractures, recent—operation on 583
Disorders of infancy and childhood, the use of antipyrin as a sedative in some of the common 640
Donald, William M.: One Year's Experience in the Home Treatment of Tuberculosis.. 618
Double harelip—new operation..... 887
Drainage after abdominal operations..... 424
in operations upon the biliary system... 722
method in the treatment of acute middle-ear disease 734
Drop method in anesthesia 144
or ether-air anesthesia for the administration of ether..... 114
Dropsy, the salt-free diet for..... 341
Drug eruptions, a contribution to the histopathology and the theory of..... 190
standardization, physiologic 110
treatment 864
Drugs, new methods of investigation in regard to the effects of, with special reference to the influence of quinine. 787
tested physiologically, a note in regard to the value of..... 468
Duodenal and gastric ulcer, perforative..... 57
ulcer 40
Dysentery treated with sodium sulphate.... 111
tropical 349
Dysmenorrhea and amenorrhea, the stem pessary for 472
Dyspepsia, intestinal—the treatment of.... 854
the value of sodium citrate in..... 407

Early aspiration in pleurisy with effusion.. 731
diagnosis of cancer of the stomach..... 32
mobilization of patients after major gynecological operations 573
recognition of cancer of the rectum and its treatment 276
Eclampsia, puerperal—the treatment of.... 196
renal decapsulation for 876
the treatment of 118

Eclampsia, the treatment of, based upon 86 cases of eclampsia and 278 of albuminuria in the maternity of the University of Pennsylvania 220
Effusion, pleuritic—the treatment of..... 547
Effusions into the knee-joint, due to contusions or sprain, the treatment of..... 64
Elbow-joint, fractures about the..... 727
Electric treatment of nevi and angiomata.. 360
Elements of a successful career..... 595
Empyema and abscess of the lung as sequels of acute suppurative appendicitis.... 660
frontal sinus—intranasal operation..... 424
some surgical aspects of..... 782
End-to-end arteriovenous angeiorrhaphy... 436
Enlarged prostate—new operation..... 62
Enlargement of the tuberosity of the tibia. 588
Enterocolitis, the dietetic treatment of..... 35
Entrance of air into the veins..... 695
Enucleation of the eye, adrenalin and novocaine for 707
of the prostate 343
Enuresis and fecal incontinence in children 795
Epilepsy and migraine, thyroid extract in.. 849
the salt-free treatment of..... 46
the treatment of 42
Episcleritis 229
Eradication by surgical means of the nasolabial line 676
Errors in the diagnosis and treatment of diseases of the skin—don'ts in dermatology 678
Esophageal stricture—plastic operation..... 667
Esophagus, suture of the—use of slices of thyroid gland 66
Estes, W. L.: Treatment of Burns..... 369
Ether-air anesthesia or the drop method for the administration of ether 114
administration, a primer on..... 844
anesthesia by the drop method..... 144
the use of adrenalin during..... 490
its indications and advantages..... 104
Ethyl chloride 571
as a general anesthetic..... 183
the pharmacology of 799
Etiology of iritis 521
Eventration, postoperative 436
Examination of the feces..... 318
practical value of. 187
Excision of mammary cancer..... 584
of the rectum—after-treatment..... 506
Experimental interstitial nephritis..... 136
partial occlusion of arteries..... 700
production of carcinoma 132
research into the resuscitation of dogs killed by anesthetics and asphyxia... 493
Extension for fractures of the leg..... 669
Extensive intestinal resection..... 888
lumbar anesthesia 359
External inflammatory diseases of the eye.. 226
Eye and the kidney..... 778
diseases, treatment of some by the general practitioner 256
external inflammatory diseases of the.. 226
Eyelids, diseases of the—treatment by suction hyperemia 131

Facial palsy—operative treatment 207
paralysis in the new-born..... 884
Falling of the bladder, cystopexy for..... 663
Fatty foods, inability to digest..... 248
Fecal drowning—its prevention in operations for intestinal obstruction..... 508
incontinence and enuresis in children.. 795
Feces, examination of the 318
practical value of examination of the.. 187
Feeding of infants, acidified milk in the.... 476
a few practical points on... 461
white-wine whey in the.... 551
Femoral neck, fractures of the—anatomic treatment 145
Fibrous enlargement of the prostate..... 471
Finger-prints, occult—the development of.. 456
Flavor, the cost of..... 711
Flatfoot or weakened feet, the proper shoes in aid of the treatment of..... 818
Flies and disease..... 469
Food supply of England 71
Foods for diabetics 477
Ford, James H.: A New Substitute for Iodoform 162
Forearm and hand, the non-operative treatment of serious injuries of the..... 610
Foreign bodies as a cause of intestinal perforation 423
in the bronchus 343
Formaldehyde and potassium permanganate for disinfection 487
disinfection 50
gas, the limitations of as a disinfectant 105
Formic aldehyde disinfection by means of potassium permanganate 459
Formidine, a new substitute for iodoform.. 162
Foulkrod, Collin: The Study of the Urine in the Toxemia of Pregnancy and in Eclampsia 223
Fourth cervical vertebra, a case of complete dislocation of the, followed by recovery.. 882
Fracture dislocation of the spine.....60, 499
of the lower end of the humerus—operation 812
of the scaphoid 722
of the sesamoid bone of the toe—is there one? 589
Fractures about the elbow-joint..... 727
and dislocations, recent—operation on. 583
of the femoral neck—anatomic treatment 145
of the forearm, pseudarthrosis after.... 205
of the leg—extension..... 669
of the metatarsus—indirect..... 433
—operative treatment 130
Frank, Ernst R. W.: The Therapeutic Value of Arhovin 163
Frontal sinus empyema—intranasal operation 424
sinusitis, acute 584
Fuming inhalations in asthma..... 701
Fundamentals in hydrotherapy..... 351
Fussell, M. Howard: Artificial Feeding of Infants in Private Practice..... 87

Gall-bladder, medical treatment of diseases of the 825
removal of the 428
Gall-stones and gall-bladder diseases from the standpoint of the physician.. 49
intestinal obstruction due to..... 62
—results of operation..... 576
Gangrene due to carbolic acid..... 541
Gastric and duodenal ulcer, perforative.... 57
carcinoma—bacteriologic diagnosis 338
the operative indication in..... 699
disorders, the medical treatment of in which the help of the surgeon is often demanded 412
paralysis, postoperative 136
ulcer—perforation 576
the operative treatment of..... 70
the treatment of 636
Gastritis, chronic 707
Gastroenteric obstruction in early infancy.. 886
Gastroenterostomy for perforating gastric ulcer, peptic ulcer of jejunum following 275
—points in technique 65
Gastrointestinal diseases, the therapeutics of mineral waters of the French Lick type in 840
Gastrojejunostomy followed by peptic ulcer 731
Gastroptosis, the treatment of..... 190
Gastrorrhagia, adrenalin irrigations in..... 413
Gastrostaxis, or oozing of blood from the mucous membrane of the stomach, the treatment of 118
General disease, iritis in..... 523
paralysis, the treatment of by mercury. 109
Genital tract, lacerations of the and their repair 453
tumors, benign—treatment during pregnancy 133
Gin-drinking, a remarkable case of in London 823
Glaucoma, acute inflammatory..... 230
Gonococcic conjunctivitis, the treatment of, with special reference to the silver salts. 4
Gonorrhea, a discussion on..... 71
and syphilis affecting the eyes..... 308
Gonorrheal arthritis in children 126
the treatment of 338
conjunctivitis 227
the treatment of 546
Good for one condition but bad for another. 388
Gordon, Alfred: Thyroid Extract in Migraine and Epilepsy Apropos of Ten Cases 849
Gout, the treatment of some of the forms of 397
Grafting of the kidneys in the bend of the elbow by arterial and venous sutures..... 100
Granular conjunctivitis 228
Graves's disease and hyperthyroidism, the medical treatment of 476
Great toe supplying the place of a thumb.. 283
Gridiron incision for abdominal section..... 813
Gritti's amputation above the knee..... 667

Gunshot wounds of the stomach, lesions associated with—treatment... 722
the treatment of... 500
Gynecological affections, the relation of mesosigmoiditis to ... 885
operations, major—the early mobilization of patients after... 573

Habitual dislocation of the shoulder—treatment ... 498
Hammond, Frank C.: Lacerations of the Genital Tract and Their Repair... 453
Hare, H. A.: The Clinical Significance of Variations in Blood-pressure... 90
Harelip, double—new operation... 887
Hay-fever, the recent treatment of... 638
Headache, the treatment of various forms of 339
Headaches, the causation and treatment of some ... 404
Head operations: control of bleeding... 206
Heart and the arterial tension, relation of the production of a rise of temperature to the action of the... 688
disease and pneumonia, the use of calcium salts as cardiac tonics in... 637
in relation to pregnancy and labor. 804
valvular—the use of digitalis in... 354
massage as a means of restoration in cases of apparent sudden death... 284
percussion, a plea for more careful... 594
stab wounds of the ... 724
stimulants in chronic valvular disease in children ... 267
the action of magnesium sulphate upon the, and the antagonistic action of some other drugs ... 877
tonics ... 44
treatment of dilatation of the... 871
Hematocytometer, on the use of a new fluid for the ... 800
Hematuria in infants and young children.. 579
Hemoglobinuria and quinine, another report upon the relationship of ... 247
malarial ... 356
Hemophilia—pathogenesis and treatment... 429
treatment of with antitoxin... 813
Hemophilic knee-joint, treatment of by operation and thyroid ... 735
Hemoptysis, amyl nitrite in... 554
Hemorrhage, accidental—some points in the diagnosis and treatment of... 62
internal—treatment by milk enemas.... 129
postpartum ... 398
the influence of intraperitoneal injections in cases of... 29
Hemorrhages from the central nervous system in the new-born in labors terminated by forceps ... 883
internal—the treatment of ... 323
Hemorrhoids, the operative treatment of under local anesthesia... 659
—treatment by injection ... 812
of under local anesthesia with sterile water ... 658
Hepatic glycogen—what is the influence of alcohol on? ... 183
inadequacy, a discussion on... 142
Hernia in children ... 250
umbilical—strangulation of intra-abdominal gut ... 721
High altitudes in the treatment of nervous disease ... 557
Hip disease—treatment of contracture of the knee ... 135
joint amputation ... 362
Hirschsprung's disease, surgical treatment of ... 510
Hirst, Barton C.: The Management of Normal Pregnancy ... 85
Hirst, John Cooke: The Treatment of Eclampsia, Based upon 86 Cases of Eclampsia and 278 of Albuminuria in the Maternity of the University of Pennsylvania ... 220
Histopathology and theory of drug eruptions, a contribution to the... 190
Homeopathic view of cactus grandiflorus... 900
Hospital abuse, a conference on in London.. 142
Hot and cold applications in medicine... 457
Houghton, E. M.: A Review of the Opsonins and Bacterial Vaccines ... 24
Houghton, E. M., and Clark, L. T.: Formic Aldehyde Disinfection by Means of Potassium Permanganate ... 459
Hour-glass stomach ... 654
Human and bovine tuberculosis, a bacteriological distinction possible between... 368
Humerus, fracture of the lower end of the —operation ... 812
Hutchings, Willard H.: Ophthalmo-reaction of Tuberculosis ... 852
Hydrocele, chronic—tubercular ... 424
Hydrotherapy in the treatment of diseases of the gall-bladder ... 826
some fundamentals in ... 851
Hygiene and diet of children, some common errors in the ... 407
and management of pregnancy ... 77
Hygienic and preventive treatment of coryza 172
Hyoscine sleep in obstetric practice... 495
Hyperemia, passive, and vaccine therapy in surgery ... 281
treatment of surgical tuberculosis... 793
Hyperplastic tuberculous pericolitis... 427
Hypertension, arterial—the treatment of... 400
Hyperthyroidism and Graves's disease, the medical treatment of ... 476
Hypodermic use of quinine... 387
of sodium cacodylate... 869
Hypothyroidism and chronic urticaria... 505
Hysterical contractures — treatment by spinal anesthesia ... 66

Ice-water enemata in the treatment of sunstroke ... 421
Ichthyol and thiocol in the treatment of tuberculosis ... 39
Immunity to carcinoma ... 133
Importance of treating the pharynx and tonsils in the early stages of some acute infections ... 95
Indication and advantages of chloroform... 103
Indications and advantages of ether... 104
for the use of opium... 716
Indigo-carmine test as an aid in the diagnosis of partial and total ureteral occlusions ... 56
Induced labor as a conservative operation for contracted pelvis ... 277
Induction of labor—best method in private practice ... 132
Inebriates, the care and treatment of... 491
Infancy and childhood, constipation in... 807
diseases of the nasopharynx in... 796
Infant feeding, acidified milk in... 476
a few practical points on... 461
artificial, in private practice.... 87
the use of sodium citrate in.... 874
white-wine whey in... 551
food, buttermilk as an... 647
Infantile diarrhea, with special reference to the use of "lactated milk"... 422
paralysis, the treatment of... 193
pyloric stenosis ... 137
Infants and children, asthma in... 480
and young children, hematuria in... 579
Infants' feeding bottles, poisonous plugs in. 417
Infected wounds—treatment with injections of oxygen gas ... 128
Infections of the biliary tract, the general principles of treatment in... 194
Infective throat conditions, the treatment of 487
Infiltration anesthesia for the operative treatment of hemorrhoids ... 659
Inflammation, the local use of magnesium sulphate solution in... 238
Inflammatory diseases of the eye, the external ... 226
Influenza, cinnamon oil in the treatment of. 124
knee, the ... 507
therapeutics and prophylaxis of by quinine ... 414
the respiratory complication of... 415
Ingle, Henry B.: Anesthesia and Methods Producing It ... 240
Injections of alcohol in nervous affections.. 46
Injuries of the brain—indications for late operation ... 361
of the semilunar cartilages... 587
Inoculation against plague, the great value of ... 481
Inoperable cancer, methylene blue in the treatment of ... 55
methylthionine hydrochloride in ... 122
Insomnia, the value of hydrotherapy in.... 352
Instances of the value of preventive medicine ... 857
Interfering action of drugs in the clinical examination of urine ... 852
Interlude of cancer, the ... 431
Internal derangement of the knee... 580
hemorrhage—treatment by milk enemas 129
hemorrhages, the treatment of... 323
Interstitial nephritis, experimental ... 186

Intestinal antisepsis 258
antiseptics 108
indigestion, the treatment of..... 854
obstruction, acute, from paralytic distention 437
due to gall-stones 62
following operations for appendicitis and salpingitis 668
the prevention of fecal drowning in operations for 508
perforation by foreign bodies 423
in typhoid fever 664
peristalsis, striped muscle, and the heart—action of several agents upon..... 20
resection, extensive 888
suture, aseptic 666
Intolerance of fats 248
Intra-articular injections in tubercular arthritis 134
Intracranial tumor, indications for operation in cases of 745
Intramuscular injections of mercury salicylate in the treatment of syphilis..... 204
Intranasal suture 582
Intraperitoneal injections in cases of hemorrhage, on the influence of..... 29
Iodide of potassium—is its use admissible in pulmonary tuberculosis? .. 235
in the treatment of actinomycosis of the cheek..... 115
Iodides, some remarks on the therapeutic action of the 47
Iodine as an antiseptic 67
Iodoform, a new substitute for..... 162
Iritis 229
a complication of gonorrhea..... 310
etiology of 521
in general disease 523
symptoms of 526
the treatment of 529
Irreducible luxation of the semilunar cartilages of the knee-joint, operative treatment of 127
Irrigation and drainage of the seminal duct and vesicle through the vas deferens..... 432
Is sulphate of soda a true intestinal antiseptic? 111
Is tobacco smoke possessed of antiseptic properties? 694

Johnston, James I.: A Study of the Symptomatology and the Treatment of Acute and Chronic Nephritis 753
Joint affections in nervous disease..... 719
tuberculous—mechanical treatment of 663
Joints, the resorptive power of..... 575
Jones, George H.: Examination of the Feces 318

Kahlo, George D.: The Therapeutics of Mineral Waters of the French Lick Type in Gastrointestinal Diseases 840
Kidney, acute unilateral septic infarcts of the 862
and bladder tuberculosis 578
and colon suspension by the use of the nephrocolic ligament and Gerota's nephrocolopexy capsule 58
and the eye 778
grafting in the bend of the elbow by arterial and venous sutures..... 100
loose—choice of procedure..... 820
modern surgery of the..... 184
movable—the surgery of..... 766
the dangerous action of mercury on the 416
the treatment of surgical affections of the 769
tuberculosis, surgical treatment of..... 509
Knee affections following injury..... 580
Knee-joint effusions due to contusions or sprains, the treatment of..... 64
hemophilia, treatment of by operation and thyroid 725
Kraurosis and leucoplasia of the vulva..... 127

Labor, induction of—best method in private practice 132
Labyrinth, cerebellar abscess and pus in the 880
Lacerations of the genital tract and their repair 453
Lack of therapeutic value of cactus grandiflorus 789
Lacrimal canals, drainage of the in affections of the conjunctiva..... 566
"Lactated milk," the use of in infantile diarrhea 422
La grippe, the treatment of..... 263
Landau cases of visceroptosis, prophylactic measures guarding against the development of 597
Landis, H. R. M.: Is the Use of Iodide of Potassium Admissible in Pulmonary Tuberculosis? 235
Laparotomy in the treatment of tuberculous peritonitis 126
Laryngeal and aural complications of typhoid fever 380
anesthetization by adrenalin and cocaine 568
stricture—gradual dilatation 429
tuberculosis, the therapeutic value of complete vocal rest during the sanatorium treatment of..... 262
Lathrop, Walter: The Treatment of Burns. 373
Lenneker, William: Remarks upon the Therapeutic Action of Convallaria..... 616
Lesions associated with gunshot wounds of the stomach—treatment..... 723
of the brain—exploratory puncture.... 424
Leucoplasia and kraurosis of the vulva.... 127
Limitations of formaldehyde gas as a disinfectant 105
Lip cancer—radical operation..... 466
Liver, protective function of the against toxic intestinal substances 705
resection of the 863
Lobar pneumonia, clinical observations and experiences in the treatment of..... 643
Local anesthesia in rectal surgery, technique of 280
infections, treatment of 324
London letter 70, 142, 214, 290, 367, 443, 518, 593, 671, 744, 823, 898
Longevity and the means of attaining it... 102
in the medical profession..... 824
Longitudinal fracture of the patella..... 506
Loose kidney—choice of procedure..... 820
Lower epiphysis of the radius, separation of the 135
Lumbar anesthesia—discussion 136
extensive 359
puncture in children, the technique of: with particular reference to the pressure of the cerebrospinal fluid 106
in uremia 426
Lung complications following operation.... 631
Lungs, operations on the..... 435
Lupus—treatment with x-rays and resorcin. 205
Luxation of the semilunar cartilages of the knee-joint, irreducible — operative treatment of 127
of the ulnar nerve 496
Lymph glands, mesenteric—abscess of the.. 730
Lysol poisoning 353

Magnesium salts injections in tetanus..... 491
sulphate solution, the local use of in inflammation 238
the action of upon the heart and the antagonistic action of some other drugs 877
Malaria, diminution of 858
hypodermic injections of quinine in.... 387
the treatment of 340, 638
Malarial fever, the treatment of..... 797
hemoglobinuria 356
Mammary cancer, excision of..... 584
Management of normal pregnancy..... 85
of pregnancy 81, 445
Marine climates in the treatment of tuberculosis 715
Martin, Edward: The Treatment of Surgical Affections of the Kidney..... 769
Mastitis, twelve cases of treated by suction apparatus 883
Maxillary sinus empyema in the new-born.. 131
tumors, diagnosis of 588
McFarland, Joseph: The Pathology and Classification of Nephritis..... 749
McKee, E. S.: The Treatment of Coryza.... 170
Means of attaining longevity..... 102
Mechanical treatment of tuberculous joint affections 663
Medical management of pregnancy..... 73
societies of London, amalgamation of the 592
treatment of congenital pyloric stenosis 651
of diseases of the gall-bladder..... 825
of Graves's disease and hyperthyroidism 476
of those gastric disorders in which the help of the surgeon is often demanded 412
of varicose veins 137

Medicinal agents, the influence of on the elimination of uric acid and creatinin.... 877
Medicine, accuracy in 860
Membranous conjunctivitis 227
Meninges and synovia—susceptibility to infection 668
Mercury in the treatment of general paralysis 109
salicylate, intramuscular injections of in the treatment of syphilis..... 204
the dangerous action of on the kidney. 416
Mesenteric lymph glands, abscess of the.... 730
obstruction of the duodenum, relation of to acute dilatation of the stomach... 507
thrombosis, a case of..... 67
Mesosigmoiditis and its relation to gynecological affections 885
Metatarsal fractures—indirect 433
Methods of producing anesthesia..... 240
Methylene blue in the treatment of inoperable cancer 55
the passage of from the maternal to the fetal circulation 640
Methylthionine hydrochloride in inoperable cancer 122
Middle-ear disease, acute—the drainage method in the treatment of..... 734
Migraine and epilepsy, thyroid extract in.. 849
Milk as a disseminator of tuberculosis..... 32
enemas in the treatment of internal hemorrhage 129
supply of London, with reference to infant feeding 214
to the children's hospitals of London 519
the chemistry of—practical application of the newer knowledge of..... 483
Miller, Charles C.: The Eradication by Surgical Means of the Nasolabial Line..... 676
Miller, E. C. L.: Directions for Determining the Opsonic Index of the Blood..... 173
Mineral waters of the French Lick type in gastrointestinal diseases, the therapeutics of 840
Modern surgery of the kidney..... 184
Morphine habit, atropine and strychnine in the treatment of the..... 695
in the treatment of cardiac degeneration apart from valvular disease 562
of eclampsia 221
poisoning, an extraordinary case of.... 44
Mouth disinfection 98
Movable kidney—results of nephropexy.... 358
the surgery of 766
Mucomembranous colitis 708
the treatment of 540
Multiple neuritis, the diagnosis and treatment of 10
Musser, John H.: Medical Treatment of Diseases of the Gall-bladder..... 825
Myositis ossificans cured by thiosinamine.. 358

Nasal tamponade in the treatment of ozena 278
Nasolabial line, the eradication by surgical means of the 676
Nasopharynx, diseases of the in infancy.... 796
Nature and treatment of angina pectoris... 52
Negligence, an action for..... 143
Nephrectomy for unilateral nephritis..... 653
Nephritides, the surgical treatment of..... 641
Nephritis, acute and chronic—a study of the symptomatology and the treatment of 753
a symposium upon 749
scarlatinal—the prophylaxis of..... 492
the circulation in 762
the pathology and classification of..... 749
the symposium on 787
the treatment of.....485, 758
Nephrocolic ligament and Gerota's nephrocolopexy capsule for kidney and colon suspension 58
Nephropexy for movable kidney..... 358
Nervous affections, injections of alcohol in. 46
disease, high altitudes in the treatment of 557
joint affections in..... 719
system, surgery of the..... 390
Neuralgia, neuritis, and reflex or referred plain, external use of adrenalin in.... 293
trifacial—the surgical treatment of.... 723
trigeminal—Schlösser's treatment for.. 420
Neuralgias treated with injections of alcohol 396
Neurasthenia 120
cholemia in 17
Neuritis, multiple—the diagnosis and treatment of 10
Neurogenic fever, the relation of the volume of air inspired to the rise of temperature in 233
Neurological surgery, a review of recent... 726
Nevi and angiomata—electric treatment.... 360
New-born, facial paralysis in the..... 884
hemorrhages from the central nervous system in the, in labors terminated by forceps..... 883
maxillary sinus empyema in the.... 131
New fluid for the hematocytometer, on the use of a 800
substitute for iodoform 162
Newer ideas of the treatment of Bright's disease 266
knowledge of the chemistry of milk, the practical application of the..... 483
News of the war on tuberculosis..... 557
Nicotine. the effect of on the circulatory system 706
Nitrate of silver in gonorrheal conjunctivitis 546
Normal pregnancy, the management of.... 85
salt solution, some of the many uses and the method of administering..... 194
Norris, Richard C.: The Management of Pregnancy 81
Notes on some anesthetic methods..... 40
Notification of births bill, passage of by the British Parliament 828
Novocaine and adrenalin for enucleation of the eye 707
for spinal anesthesia 672
Nuclein in the prophylaxis and treatment of infections of the peritoneum..... 632
Nutritional disturbances in infancy due to overfeeding 705

Obesity, cardiac and renal disease, etc., the dechloridation treatment in..... 494
Obstetric forceps and version as methods of delivery, the relative value of..... 535
practice, the hyoscine sleep in..... 495
Obstruction, acute, due to appendicitis..... 736
gastroenteric, in early infancy..... 886
Occlusion of arteries, partial—experimental. 700
Occult finger-prints, the development of... 456
Ocular manifestations in venereal diseases. 308
One year's experience in the home treatment of tuberculosis 618
Oozing of blood from the mucous membrane of the stomach, the treatment of..... 113
Opening the cranial cavity for the removal of tumors 730
Open method of treating burns..... 376
Operations on the cerebellum..... 655
on the posterior cranial fossa..... 510
Operative technique, aseptic..... 329
treatment of fractures 130
Ophthalmia, gonorrheal, leading to partial or total blindness 309
Ophthalmias, purulent, treated with argyrol solutions 475
Ophthalmo-reaction of tuberculosis 852
Opium, indications for the use of..... 716
Opsonic index of the blood, directions for determining the 173
Opsonins, the 713
and bacterial vaccines, a review of the 24
and treatment by bacterial vaccines.... 503
Oral administration of antitoxin..... 29
Organic and inorganic combinations of phosphorus, the comparative therapeutic value of 121
Osteomalacia, the curative action of adrenalin in 636
Ott, Isaac, and Scott, John C.: The Relation of the Production of a Rise of Temperature to the Action of the Heart and the Arterial Tension..... 688
The Relation of the Volume of Air Inspired to the Rise of Temperature in Neurogenic Fever 233
Ott, Isaac, and Ulman, Joseph R.: Action of Several Agents upon Intestinal Peristalsis, Striped Muscle, and the Heart..... 20
Ovarian transplantation followed by pregnancy 128
Overfeeding of infants, nutritional disturbances due to 705
Overlooked method by which typhoid fever is distributed 630
Over-nutrition and under-nutrition, a discussion of 196
Oxygen gas, injections of in the treatment of infected wounds 128
in asphyxia neonatorum 120
Ozena—treatment by nasal tamponade..... 278

Pancreatectomy, the technique of..... 814
Pancreatic extract in the treatment of cancer 812
Paquelin cautery in the treatment of typhoid fever 561
Paralyses of the brachial plexus, some observations on 430
Paralysis, facial, in the new-born 884
gastric—postoperative 136
general—the treatment of by mercury.. 109
infantile—the treatment of..... 193
syphilitic, of the facial and auditory nerves 133
Paralytic distention, acute intestinal obstruction from 437
Parathyroid extract in the treatment of puerperal eclampsia 359
glands, a consideration of the..... 292
surgical relations of the..... 201
Paraungual panaritium, Bier method of treatment for 328
Paris letter 747
Passage of methylene blue from the maternal to the fetal circulation..... 640
Patellar fracture, longitudinal 506
Pathogenesis and treatment of hemophilia.. 429
Pelvic contracture—best conduct to follow. 207
Penetrating wounds of the abdomen..... 656
Peptic ulcer following gastrojejunostomy.. 731
of jejunum following gastroenterostomy for perforating gastric ulcer 275
Percussion of the heart, a plea for more careful 594
Perforative gastric and duodenal ulcer..... 57
Pericolitis, hyperplastic tuberculous 427
Peritoneal infections through the agency of nuclein; prophylaxis and treatment of.... 632
Peritonitis from salpingitis in children.... 505
tuberculous—surgical treatment of 125
—when to operate 287
Pernicious vomiting of pregnancy, the treatment of 564
Personal equation in the treatment of disease 247
Peterson, Reuben: The Management of Pregnancy 445
Pharmaceutical preparations, standardization of 41
Pharmacology of ethyl chloride 799
Pharynx and tonsils, the importance of treating in the early stages of some acute infections 95
Phlebitis, postoperative—prophylaxis and treatment of 889
Phlyctenular conjunctivitis 229
Phosphorus, the comparative therapeutic value of organic and inorganic combinations of 121
Phthisis, pulmonary—the successful treatment of in general practice..... 383
Physiological action, elimination, and therapeutic application of sodium cacodylate, used hypodermically 869
effect of alcohol on the animal body.... 401
Physiologically tested drugs, a note in regard to the value of..... 468
Physiologic standardization of drugs..... 110
Picric acid in the treatment of burns, the value of 629
Pilocarpine as an adjuvant in the treatment of syphilis 870
for the relief of pruritus..... 809
in the treatment of eclampsia..... 221
Pitfield, Robert L.: The Development of Occult Finger-prints 456
Placenta previa—treatment in private practice 814
Plague, adrenalin in—further observations in the use of 253
the great value of inoculation against. 481
Plastic operation for stricture of the esophagus 667
Plea for a more rational therapy in tuberculosis 117
Pleural effusion, the treatment of..... 181
resistance to infection..... 128
Pleurisy and pulmonary tuberculosis, the relationship of from a prophylactic standpoint 31
with effusion, early aspiration in..... 731
the treatment of 547
Pneumonia and chloroform-oxygen anesthesia 358
and heart disease, the use of calcium salts as cardiac tonics in.....388, 637
lobar—clinical observations and experiences in the treatment of..... 643
Pogue, G. R.: Tubercle Bacilli Products in the Treatment of Tuberculous Lesions... 314
Poisoning by lysol 353
by morphine, an extraordinary case of. 44
by water gas, carburetted water gas, and carbon monoxide, the treatment of 260
Poisonous plugs in infants' feeding bottles. 417
Politzer bag in the treatment of acute middle-ear disease 736
Postdiphtheric paralysis, can antitoxin prevent it, given before infection as a prophylactic? 803
Postoperative eventration 436
gastric paralysis 136
obstruction 668
due to Trendelenburg posture..... 130
treatment 697
Postpartum hemorrhage 398
Potassium permanganate and formaldehyde for disinfection 487
as a means of formic aldehyde disinfection 459
Pottenger, F. M.: The Principles Underlying the Treatment of Tuberculosis..... 611
Practical points in the diagnosis and treatment of diseases of the skin..... 328
Practice of surgery, sulphate of sparteine in the 403
Pregnancy, actinomycosis in 133
and labor, heart disease in relation to.. 804
and uterine cancer 132
diseases of the kidneys as indications for the interruption of..... 124
following transplantation of an ovary.. 128
normal—the management of 85
pernicious vomiting of—treatment..... 564
the hygiene and management of..... 77
the management of 81, 445
the medicinal management of..... 73
the toxemia of—some experiences in the symptomatology and treatment of, based on the study of 78 cases 217
of—study of the urine in and in eclampsia 223
Preparations of digitalis 418
Present views on diseases of the joints..... 279
Pressure of the thymus gland causing thymus stenosis and death 362
Preventive medicine, instances of the value of 857
Priapism, prolonged 542
Primary ligation of the vas deferens before removing the testicle..... 809
sarcoma of the stomach..... 56
typhlitis without appendicitis..... 816
Primer on the administration of ether..... 844
"Principia Therapeutica" 72
Principle of top milks 346
Principles of treatment of renal insufficiency 243
Proctoscopy 667
Prolapse of the rectum—operation of choice 575
Proper shoes in aid of the treatment of flat-foot or weakened feet..... 818
Prophylactic measures guarding against the development of Landau cases of visceroptosis 597
Prophylaxis and treatment of postoperative phlebitis 889
in syphilis 660
Prostate and bladder tuberculosis..... 205
enucleation of the..... 343
fibrous enlargement of the..... 471
Prostatectomy 497
Prostatic enlargement—new operation..... 62
the treatment of 60
Protargol, argyrol, and silver nitrate, the comparative efficiency of 411
Protective function of the liver against toxic intestinal substances 705
Pruritus, the use of pilocarpine for the relief of 809
Pseudarthrosis after fractures of the forearm 205
Psoriasis, the cure of 259
the treatment of 473
treated by thyroid and salicin..... 488
Ptosis, an especially constructed belt for use in 601
Publisher's announcement 1
Puerperal eclampsia, the treatment of..... 196
—treatment with parathyroid extract 359
infection increased by antiseptic douches 423
—use of collargol injections..... 357
Pulmonary phthisis, the successful treatment of in general practice..... 383

Pulmonary tuberculosis and pleurisy, the relationship of from a prophylactic standpoint 31
certain aspects of treatment of 865
—is the use of iodide of potassium admissible? 235
use of tuberculin for diagnosing 790
Purpura, adrenalin in..... 711
Purulent ophthalmias treated with argyrol solutions 475
Pus tubes in the male 810
Pyloric hypertrophy, congenital..... 867
stenosis, congenital—the medical treatment of 651
in infants 137
Pyrexia and subnormal temperatures in infancy and childhood, some observations on 268

Quack medicines, the vending of in England 72
Quarterly Journal of Medicine—a new English publication 824
Question of climate in the treatment of tuberculosis 96
Quinine, a comparison of the therapeutic action of the various commercial salts of 710
and hemoglobinuria, another report upon the relationship of 247
as a cause of blackwater fever..... 48
especial reference to the influence of in a study of the effects of drugs..... 787
in malarial hemoglobinuria 356
in the treatment of influenza..... 414
of malarial fever 797
the hypodermic use of..... 387

Rapid dilatation, bloody method of..... 279
Rattlesnake-bite, adrenalin chloride in the treatment of 107
Recent research work on anesthetics 717
Recipes for baldness 406
Recompression for compressed-air illness.. 563
Rectal carcinoma—operative technique..... 654
excision—after-treatment 506
injections in the treatment of constipation 348
prolapse—operation of choice 575
surgery, technique of local anesthesia in 280
Reduction of dislocation of the cervical vertebra, successful 810
Reflex anuria caused by cystoscopy..... 67
Relation of the production of a rise of temperature to the action of the heart and the arterial tension 688
Relative value of the salts of silver..... 182
Removal of the gall-bladder..... 428
Renal decapsulation for eclampsia..... 876
disease, varieties of which produce retinal lesions 780
insufficiency, the principles of treatment of 243
surgery, contributions to 587
Resection of the cecum without preliminary false anus 275
of the liver 863
Resistance of the pleura to infection..... 128
Resorcin and x-rays in the treatment of lupus 205
Resorptive power of joints..... 575
Respiratory complications of influenza..... 415
Resuscitation of dogs killed by anesthetics and asphyxia, an experimental research into the 493
Retinal lesions in chronic Bright's disease, frequency of 782
Review of a recent series of operations upon the stomach 725
of recent neurological surgery..... 726
Rhein, John H. W.: The Treatment of Arthritis Deformans 159
Rheumatism, acute articular—a clinical study of 210 cases 265
the administration of the salicylates in. 443
Rhinitis, atrophic 410
Richardson, Hubert: Cholemia in Neurasthenia 17
Rickets, the treatment of..... 646
Risley, Samuel D.: Symptoms of Iritis..... 526
Rodent ulcer, the treatment of by zinc ions. 572
Rotary dislocation of the atlas..... 439
Royer, Franklin B.: An Analysis of the Kidney Condition of Eight Hundred Cases of Scarlet Fever Treated with Routine Doses of Chloral Hydrate: The Analysis Contrasted with Seven Hundred and Fifty-six Cases Having the Usual Remedies.... 1

Rubber gloves, the use of in all operative work 331
Rugh, J. Torrance: Appendicitis Simulating Sacroiliac Disease and Sciatica..... 673
Ruth, C. E.: Fractures of the Femoral Neck—Anatomic Treatment 145

Sacroiliac disease and sciatica, appendicitis simulating 673
Salicin and thyroid in psoriasis 488
Saline infusion in chloroform narcosis, the value of 696
treatment of tropical dysentery..... 350
Salpingitis associated with peritonitis in children 505
Salt-free diet for dropsy..... 341
treatment of epilepsy 46
Sarcoma, conservative treatment of advanced and recurrent cases of..... 609
primary, of the stomach..... 56
Sawyer, James: Specific Medication in the Treatment of Tuberculosis 167
Scalds and burns, the treatment of in the Pottsville Hospital 379
treatment of 702
Scaphoid fracture 722
Scarlatinal nephritis, the prophylaxis of... 492
Scarlet fever: its treatment at the hospital for scarlet fever and diphtheria patients 478
the treatment of 216
treated with routine doses of chloral hydrate, an analysis of the kidney condition of 800 cases of 1
treatment of 544
Schlösser's treatment for trigeminal neuralgia 420
Seasickness, the use of chloretone in..... 644
Semilunar bone, dislocatidn of the..... 65
cartilages, injuries of the..... 587
Seminal duct and vesicle, irrigation and drainage of through the vas deferens. 432
tubes, infections of the..... 810
vesicle tuberculosis—treatment 425
Separation of the lower epiphysis of the radius 135
Serum injection of tetanus, prophylactic.... 510
therapy of tetanus 127
treatment of tuberculosis of the bladder 56
Sesamoid bone of the toe—is there a fracture of the? 589
Shock, the treatment of..... 249
Silverized catgut 496
Silver nitrate, protargol, and argyrol, the comparative efficiency of 411
salts in the treatment of gonococcic conjunctivitis 4
relative value of the 182
the action of..... 408
Sinusitis, acute frontal 584
Skin diseases, practical points in the diagnosis and treatment of..... 828
Sleeping sickness, its treatment by atoxyl.. 900
Sodium bicarbonate, the use and abuse of.. 545
cacodylate, the physiological action, elimination, and therapeutic application of, used hypodermically..... 869
citrate in dyspepsia, the value of..... 407
in infant feeding 874
Some considerations in the use of cardiac tonics 867
facts as to anesthetics..... 855
indications for the treatment of cholera 712
plain truths about syphilis..... 791
Somers, Lewis S.: The Aural and Laryngeal Complications of Typhoid Fever..... 380
Specific disease—can it be aborted?..... 245
medication in the treatment of tuberculosis 167
Spina bifida, excision of the sac in..... 394
Spinal analgesia in one hundred cases..... 581
anesthesia 606
for hysterical contractures..... 66
its advantages and disadvantages.. 123
stovaine for 531
the value of 693
—3000 cases with tropacocaine..... 206
concussion 33
Spine, fracture dislocation of the.....60, 499
Spirochæta pallida, a discussion of the..... 214
Splanchnoptosis, the surgical treatment of. 818
Splenectomy and Banti's disease..... 59
Sprains and their significance..... 281
Stab wounds of the heart..... 724
Standardization of pharmaceutical preparations 41

Stanton, William B.: The Circulation in Nephritis 762
Stem pessary for amenorrhea and dysmenorrhea 472
Sterile catgut 589
Sterile-water anesthesia, hemorrhoids operated on under 658
Stomach, review of a recent series of operations upon the 725
Stovaine spinal anesthesia.....531, 581
Strangulation of intra-abdominal gut in a case of umbilical hernia..... 721
Stricture of the esophagus—plastic operation 667
of the larynx—gradual dilatation..... 429
of the urethra—radical cure..... 66
Strophanthus as a heart tonic..... 45
Subnormal temperatures and pyrexia in infancy and childhood, some observations on 268
Suction hyperemia in the treatment of diseases of the eyelids 131
Successful career, elements of a..... 595
Sudden cerebral lesions: their diagnosis and treatment 803
death, apparent—heart massage as a means of restoration in cases of..... 284
Sulphate of soda—is it a true intestinal antiseptic? 111
of sparteine in surgical practice..... 403
Sunstroke treated by ice-water enemata... 421
Suprapubic cystotomy in children..... 206
Suprarenal gland transplantation 588
glands and osteomalacia 636
Surgery in diabetes 733
in the treatment of epilepsy..... 43
of movable kidney 766
of the blood-vessels 129
of the chest 434
of the nervous system..... 390
of the thorax 505
Surgical affections of the kidney, the treatment of 769
aspects of empyema 732
practice, a summary of certain forms of (from the Samaritan Hospital service) 604
relations of the parathyroid glands.... 201
treatment of Hirschsprung's disease.... 510
of nephritides 641
of splanchnoptosis 818
of trifacial neuralgia 723
of tuberculosis of the kidney..... 509
of tuberculous peritonitis 125
tuberculosis, the hyperemia treatment of 793
Suture of the esophagus—use of slices of thyroid gland 66
Sutures within the cavity of the nose..... 582
Swaving, J. Harry: The Treatment of Burns and Scalds Employed in the Pottsville Hospital 379
Symposium upon nephritis 749
Symptoms of iritis 526
Synovia and meninges—susceptibility to infection 668
Syphilis, congenital 143
pilocarpine as an adjuvant in the treatment of 870
prophylaxis in 660
some plain truths about 791
the routine treatment of with intramuscular injections of mercury salicylate 204
Syphilitic alopecia 502
paralysis of the facial and auditory nerves 133

Tampons, vaginal—some points of practical interest 39
Technique of pancreatectomy 814
Tendon transplantation, results of..... 573
Testicle, tuberculosis of the..... 879
of the—results of castration. 207
undescended 820
Testis, tuberculosis of the in the infant.... 878
Tetanus, injection of magnesium salts in... 491
—prophylactic serum injection 510
the serum therapy of 127
the treatment of 54
Tetany associated with chronic dilatation of the colon 215
Therapeutic action of the iodides, some remarks on the 47
of the various commercial salts of quinine, a comparison of the 710
value of arhovin 163
of the x-ray 257
Therapeutics and common sense..... 627
and prophylaxis of influenza by quinine 414
of mineral waters of the French Lick type in gastrointestinal diseases..... 840
Thiocol and ichthyol in the treatment of tuberculosis 39
Thiosinamine in myositis ossificans 358
Thoracentesis, accidents following..... 543
Thoracic aneurism 570
Thorax, surgery of the..... 505
Throat conditions, infective—the treatment of 487
Thrombosis, mesenteric—a case of..... 67
Thumb replaced by a great toe..... 283
Thymus stenosis and death due to pressure of the thymus gland..... 362
Thyroid and salicin in psoriasis..... 488
extract in migraine and epilepsy apropos of ten cases 849
in the treatment of eclampsia..... 221
gland—successful transplantation..... 423
use of for covering wounds in the esophagus 66
transplantation into the spleen..... 135
treatment of hemophilic knee-joint.... 725
Tobacco smoke—is it possessed of antiseptic properties? 694
Top milks, the principle of..... 346
Torrance, Gaston: Stovaine Spinal Anesthesia 531
Toxemia of pregnancy, some experiences in the symptomatology, and treatment of, based on the study of 78 cases..... 217
study of the urine in the and in eclampsia 223
Toxemic headaches, the treatment of..... 405
Toxic intestinal substances, the protective function of the liver against..... 705
Tragic end of a medical man in England... 824
Transfusion as a means of lessening chloroform shock 816
in severe anemia 801
of blood, direct 344
Transplantation of suprarenal glands..... 588
of tendon, results of 573
of the thyroid into the spleen..... 135
of thyroid gland, successful..... 423
Trauma of the uterus, abdominal section for 61
Trend of the times in appendicectomy..... 60
Trifacial neuralgia, the surgical treatment of 723
Trigeminal neuralgia, Schlösser's treatment for 420
Tropacocaine for spinal anesthesia..... 206
Tropical dysentery 349
Trypsin treatment of cancer 261, 470, 661
report on the.... 494
Tubation of the pharynx to facilitate administration of anesthetics, the technique of.. 438
Tubercle bacilli products in the treatment of tuberculous lesions 314
Tubercular adenitis—treatment by x-rays.. 131
arthritis—technique of intra-articular injections 134
disease of the upper respiratory tract, treatment of 37
hydrocele, chronic 424
Tuberculin, preparation of 852
the use of for diagnostic purposes..... 790
Tuberculosis, a plea for a more rational therapy in 117
atoxyl in the treatment of..... 806
climate in the treatment of..... 269
human and bovine—a bacteriological distinction possible between 868
laryngeal—the therapeutic value of complete vocal rest during the sanatorium treatment of 262
news of the war on 557
of the bladder and kidneys..... 578
serum treatment of..... 56
—treatment 577
of the kidney, surgical treatment of.... 509
of the prostate and bladder..... 205
of the seminal vesicles—treatment..... 425
of the testicle 879
—results of castration..... 207
of the testis in the infant..... 878
one year's experience in the home treatment of 618
ophthalmo-reaction of 852
pulmonary, and pleurisy—the relationship of from a prophylactic standpoint 81
—certain aspects of the treatment of 865
—is the use of iodide of potassium admissible? 235

Tuberculosis, specific medication in the treatment of 167
surgical—the hyperemia treatment of.. 793
the dissemination of through milk..... 32
the principles underlying the treatment of 611
the question of climate in the treatment of 96
the treatment of by marine climates... 715
the value of cod-liver oil in..... 859
watery extract of tubercle bacilli in the treatment of 385
Tuberculous joint affections, mechanical treatment of 663
lesions treated with tubercle bacilli products 314
pericolitis, hyperplastic 427
peritonitis, surgical treatment of..... 125
—when to operate 287
Tuberosity of the tibia, avulsion of the..... 817
enlargement of the.... 588
Tucker, Henry: The Local Use of Magnesium Sulphate Solution in Inflammation.. 238
Tumor, intracranial—indications for operation in cases of..... 745
Tumors, abdominal, in children..... 57
of the brain—palliative operation..... 425
of the maxilla, diagnosis of..... 588
opening the cranial cavity for the removal of 730
the diagnosis of—the results of overconfidence and delay 342
Tympany and colitis in typhoid, how to meet 876
Typhlitis, primary, without appendicitis.... 816
Typhoid bacillus, the action of wine on the. 567
fever—an overlooked method by which it is distributed 630
intestinal perforation in..... 664
the aural and laryngeal complications of 380
how to meet tympany and colitis in.... 876
spine, treatment of the.....560, 733
Tyson, James: The Treatment of Nephritis. 758

Ulcerative colitis and acute colitis..... 868
Ulcer, chronic, of the stomach not cured by gastroenterostomy 500
gastric and duodenal—perforative 57
—perforative 576
—the operative treatment of..... 70
—the treatment of 636
of the duodenum 40
rodent—the treatment of by zinc ions.. 572
Ulnar nerve, luxation of the..... 496
Umbilical hernia—strangulation of intra-abdominal gut 721
Under-nutrition and over-nutrition, a discussion of 196
Undescended testicle 820
Unexpected recoveries from carcinoma..... 814
Unilateral nephritis—nephrectomy 653
septic infarcts of the kidney, acute.... 862
Upper chest breathing, the absence of a cause of common baldness..... 431
respiratory tract, treatment of tubercular disease of the 37
Uremia 772
treatment of 426
Uremic amaurosis in acute nephritis..... 779
Ureteral occlusions, partial and total—value of indigo-carmine test as an aid in the diagnosis of 56
stricture—radical cure 66
Urethrotomy—after-care 502
Uric acid and creatinin, the influence of some medicinal agents on the elimination of 877
Urinary organs, anesthetization for operations on the 426
Urine, the interfering action of drugs in the clinical examination of 352
Urmson, Allan W.: The Treatment of Burns 376
Urticaria, chronic, and hypothyroidism.... 505
—experimental study of some cases.... 501
Use and abuse of sodium bicarbonate..... 545
Useful stump after amputation of the arm.. 180
Uterine cancer and pregnancy..... 132
Uterus, trauma of the—abdominal section for 61

Vaccination of the cornea..... 399
Vaccines, bacterial, and opsonins..... 503
Vaccine therapy and passive hyperemia in surgery 281
Vaginal tampon, the—some points of practical interest 39
Value of spinal anesthesia 693
Valvular disease, chronic, in children—the treatment of 267
of the heart, the use of digitalis in 354
Variations in blood-pressure, the clinical significance of 90
Varicose veins and varicose ulcers of the leg, the operative treatment of 609
—medical treatment 137
Various forms of headache, the treatment of 339
Vasculodepressor drugs 34
Vas deferens, primary ligation of the before removing the testicle 809
Veins, the entrance of air into the..... 695
Velocity of the blood current, the influence of digitalis, strophanthus, and adrenalin upon the 490
Venereal diseases, ocular manifestations in. 308
Venesection in apoplexy 549
Ventrofixation, difficult labor following.... 206
Vernal conjunctivitis 228
Version and the obstetric forceps as methods of delivery, the relative value of..... 535
Vertigo 255
Visanska, Samuel A.: A Few Practical Points on Infant Feeding 461
Visceroptosis, prophylactic measures guarding against the development of Landau cases of 597
Vivisection, a discussion on 520
Vocal rest, complete, during the sanatorium treatment of laryngeal tuberculosis—the therapeutic value of 262
Volume of air inspired, the relation of the to the rise of temperature in neurogenic fever 233
Vomiting of anesthesia, prevention of the.. 360
of pregnancy, pernicious—the treatment of 564
Von Ruck, Karl: The Successful Treatment of Pulmonary Phthisis in General Practice 383
Vulvar leucoplasia and kraurosis 127

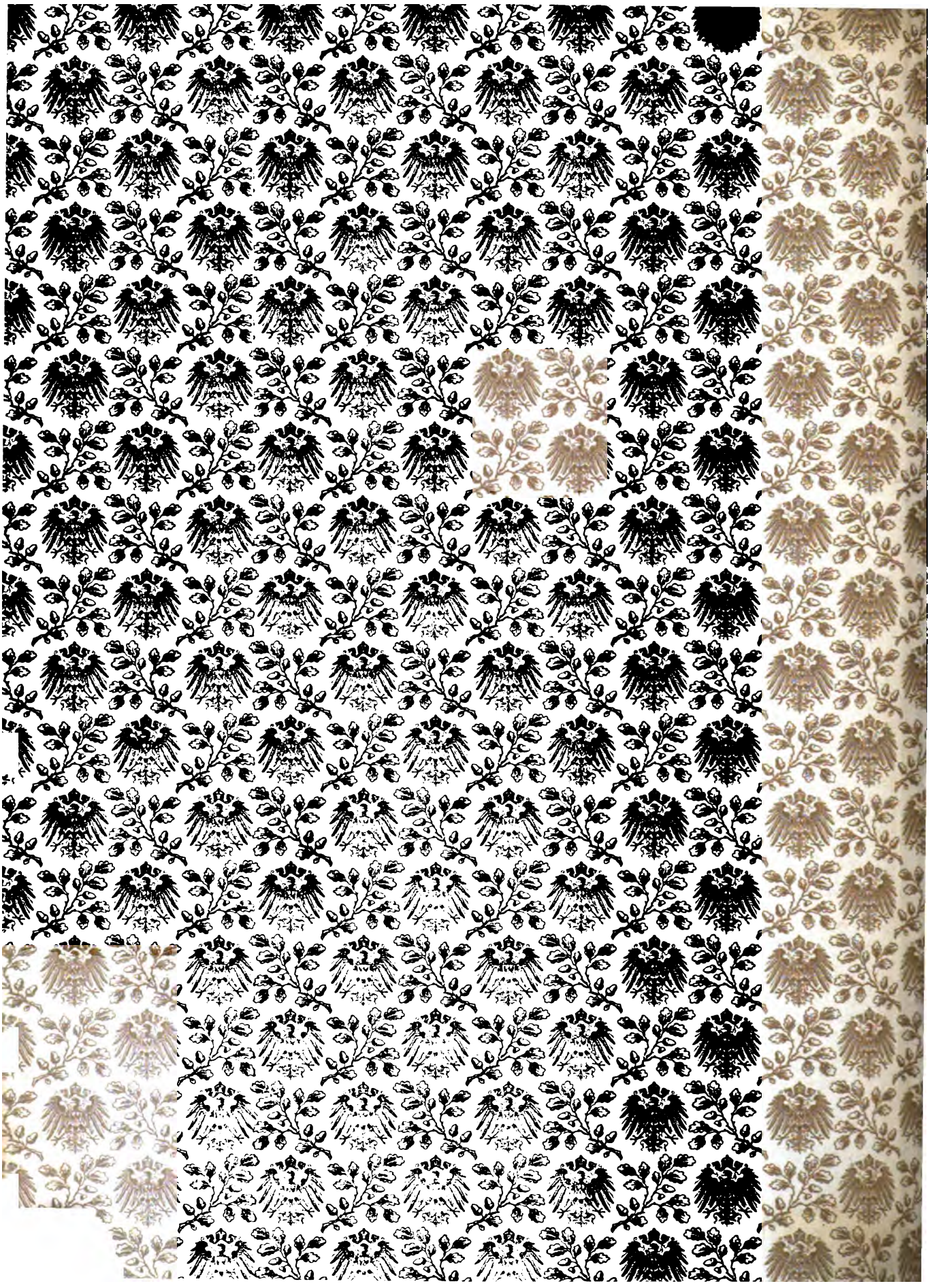
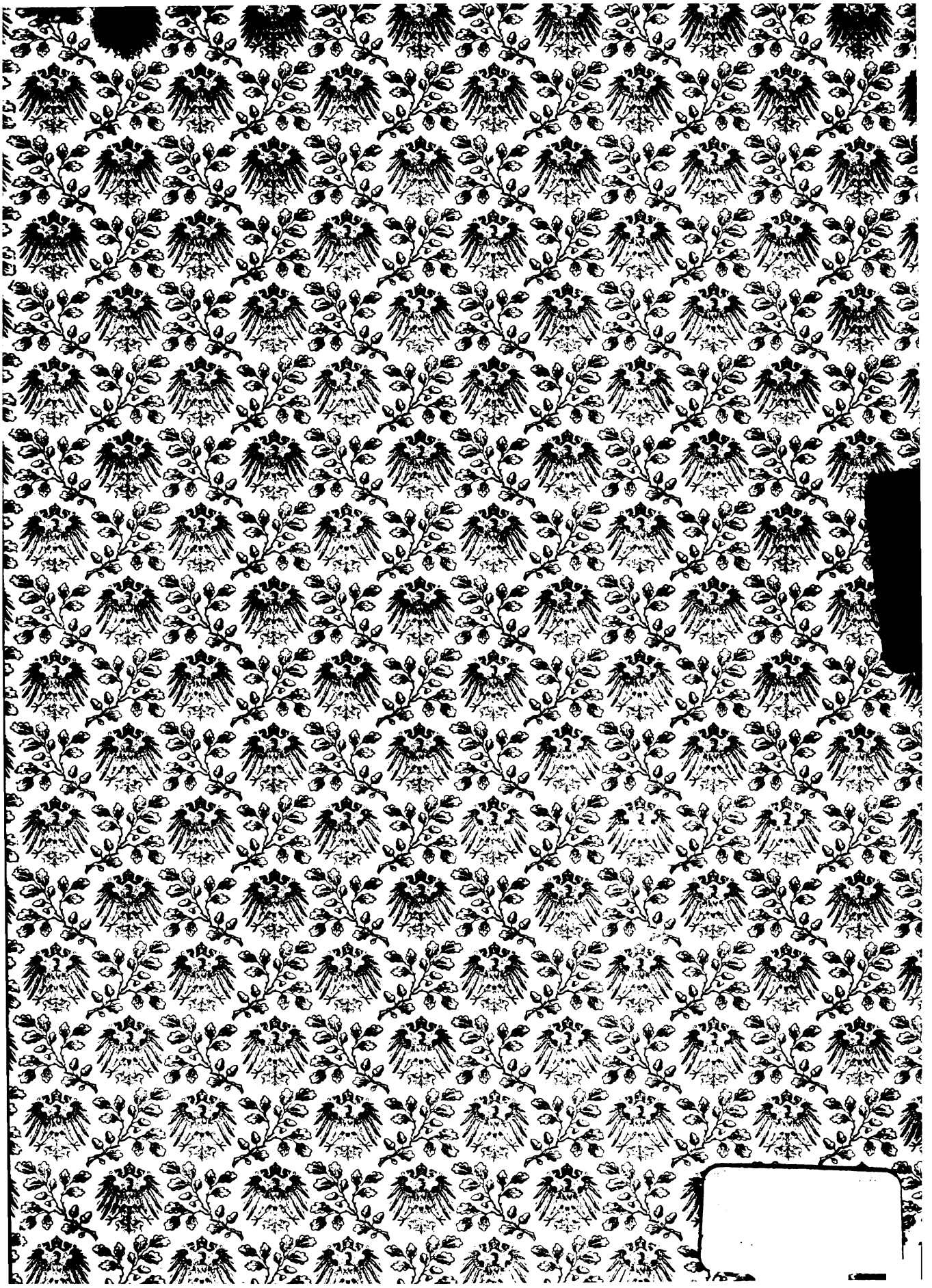
War on tuberculosis, news of the..... 557
Water gas, carburetted water gas, and carbon monoxide poisoning, the treatment of 260
Watering-places of France 747
Watery extract of tubercle bacilli in the treatment of tuberculosis 167, 385
Weakened feet or flatfoot, the proper shoes in aid of the treatment of..... 818
Wells, William H.: Some Experiences in the Symptomatology and Treatment of the Toxemia of Pregnancy as Based on the Study of 78 Cases 217
The Relative Value of the Obstetric Forceps and Version as Methods of Delivery 535
Werley, G.: The Treatment of Internal Hemorrhages 323
Where to send consumptives 555
White-wine whey in infant feeding..... 551
Whooping-cough: its treatment by an improved abdominal belt 483
Wide-spread preventive measures in the struggle with disease, the necessity for.. 467
Wieder, Henry S.: A Primer on the Administration of Ether 844
Treatment of Local Infections..... 324
Wine, the action of on the typhoid bacillus. 567
Winter underclothing for children..... 116
Wounds, gunshot—the treatment of..... 500
of the abdomen, penetrating 656
of the heart 724
Wright's opsonic index..... 316
Wrist dislocations, compound 133

X-rays and resorcin in the treatment of lupus 205
causing abortion 429
diseases that suggest special dangers in use of 197
in the treatment of tubercular adenitis. 131
therapeutic value of the..... 257

Yeo's respirator in the treatment of pulmonary tuberculosis 594
Young children and infants, hematuria in.. 579

Zentmayer, W. M.: Etiology of Iritis..... 521
Ziegler, S. Lewis: The Treatment of Iritis. 529
Zinc ions in the treatment of rodent ulcer.. 572

BOOK REVIEWS.

American Pocket Medical Dictionary. Edited by W. A. N. Dorland..... 518
American Practice of Surgery. Edited by Joseph D. Bryan and Albert H. Buck..289, 592
Anders, Howard S.: Physical Diagnosis... 440
Anders, James M.: A Text-book of the Practice of Medicine 889
Arrhenius, Svante: Immuno-chemistry.... 893
Ashton, William E.: A Text-book on the Practice of Gynecology..... 213
Bishop, Seth Scott: The Ear and its Diseases 669
Blair, Thomas S.: A Practitioner's Handbook of Materia Medica and Therapeutics 442
Boas, I.: Diseases of the Stomach..... 670
Bramwell, J. Milne: Hypnotism..... 513
Bricker, Walter M., and Moschcowitz, Eli: Five Hundred Surgical Suggestions..... 897
Bulkley, L. Duncan: Principles and Application of Local Treatment of Diseases of the Skin 364
Carter, Alfred H.: Elements of Medicine... 69
Croftan, Alfred C.: Clinical Therapeutics.. 891
Da Costa, John Chalmers: Modern Surgery, General and Operative 592
Danforth, I. A.: The Life of Nathan Smith Davis, A.M., LL.D. 895
Deansley, Edward: Modern Methods of Diagnosis in Urinary Surgery 897
Delafield, Francis, and Prudden, T. Mitchell: A Text-book of Pathology 893
De Lee, Joseph B.: Obstetrics for Nurses... 141
De Schweinitz, G. E.: Diseases of the Eye. 209
Drew, Gilman A.: A Laboratory Manual of Invertebrate Zoölogy 591
Duncan, Robert Kennedy: The Chemistry of Commerce 893
Edwards, Arthur R.: A Treatise on the Principles and Practice of Medicine..... 513
Egbert, Seneca: A Manual of Hygiene and Sanitation 740
Eisendrath, Daniel N.: A Text-book of Clinical Anatomy 897
Surgical Diagnosis 593
Encyclopedia and Dictionary of Medicine and Surgery 516
Escot, E. Pozzi: The Toxins and Venoms, and Their Antibodies 365
Ferguson, J. Bruce: Diseases of the Nose and Throat 365
Fischer, Louis: Diseases of Infancy and Childhood 740
Fischer, Martin H.: The Physiology of Alimentation 744
Forel, August: Hygiene of Nerve and Mind in Health and Disease 821
Fowler, George Ryerson: A Treatise on Surgery 212
Francine, Albert Philip: Pulmonary Tuberculosis: Its Modern and Special Treatment 68
French, James Magoffin: A Text-book of the Practice of Medicine..... 893
Gleason, E. B.: A Manual of the Diseases of the Nose, Throat, and Ear..... 591
Gotthelf, William S.: The Treatment of Skin Cancers 441
Gould, Alfred H.: The Technique of Operations upon the Intestine and Stomach..... 213
Gould, George M.: The Practitioners' Medical Dictionary 208
Gouley, J. W. S.: Surgery of Genito-urinary Organs 366
Grayson, Charles Prevost: Diseases of the Nose, Throat, and Ear 68
Greene, Charles Lyman: Medical Diagnosis 211
Greene, Charles Wilson: Kirkes' Handbook of Physiology 895
Greene, Robert H., and Brooks, Harlow: Diseases of the Genito-urinary Organs and the Kidney 896
Greene's Encyclopedia and Dictionary of Medicine and Surgery 363, 742
Griffith, J. P. Crozer: The Care of the Baby 517
Hallberg, C. S., and Salisbury, J. H.: A Physician's Manual of the Pharmacopœia and the National Formulary 742
Hardaway, W. A., and Grindon, Joseph: A Handbook of Cutaneous Therapeutics.... 894
Hare, Hobart Amory: A Text-book of Practical Therapeutics 441
A Text-book of the Practice of Medicine 209
Practical Diagnosis 742
Harey Lectures, the 210
Hecker, R., and Trumpp, J.: Atlas and Epitome of Diseases of Children 441
Heisler, John Clement: Text-book of Embryology 442
Herter, C. A.: Bacterial Infections of the Digestive Tract 590
Homans, James E.: Self-propelled Vehicles 592
Howell, William H.: A Text-book of Physiology 740
Index Catalogue of the Library of the Surgeon-General's Office, United States Army 743
International Clinics 364, 743
International Medical Annual 363
Kassabian, M. K.: Roentgen Rays and Electrotherapeutics 891
Kerley, Charles Gilmore: The Treatment of the Diseases of Children 670
Kerr, Le Grand: The Diagnostics of the Diseases of Children 517
King, A. F. A.: A Manual of Obstetrics.... 518
Luckett, Wm. H., and Horn, Frank I.: Paraffin in Surgery 366
Lusk, Graham: The Elements of the Science of Nutrition 140
Manton, W. P.: A Syllabus of Lectures on Embryology 140
Manual of Personal Hygiene. Edited by Walter M. Pyle 516
Manual of the Diagnosis and Treatment of Diseases of the Eye 591
Marsden, R. W.: Hints on the Management of the Commoner Infections 442
Massey, G. Betton: Conservative Gynecology and Electrotherapeutics 139
May, Charles H.: A Manual of Diseases of the Eye 744
McFarland, Joseph: A Text-book upon Pathogenic Bacteria 141
Medical Record Visiting List for 1908..... 895
Modern Medicine. Edited by William Osler. 511, 737
Morton, Henry H.: Genito-urinary Diseases and Syphilis 141
Moynihan, B. G. A.: Abdominal Operation.. 211
Mukerji, U. N.: Nutrition and Dysentery.. 744
Nothnagel, D. Hermann: Diseases of the Intestines and Peritoneum 669
Ott, Isaac: A Text-book of Physiology.... 892
Park, Roswell: The Principles and Practice of Modern Surgery 896
Pattee, Alida Frances: Practical Dietetics with Reference to Diet and Disease..... 210
Paul, George P.: A Text-book of Materia Medica for Nurses 442
Pauli, Wolfgang: Physical Chemistry in the Service of Medicine 365
Practice of Gynecology in Original Contributions by American Authors. Edited by J. Wesley Bovee 442
Practice of Obstetrics. Edited by Reuben Peterson 591
Practitioner's Visiting List for 1908..... 895
Progressive Medicine. Edited by H. A. Hare 69, 364, 590, 739
Pusey, William Allen: The Principles and Practice of Dermatology 517
Reed, Boardman: Lectures to General Practitioners on Diseases of the Stomach and Intestines 69
Register, Edward G.: Practical Fever Nursing 742
Reissig, Carl, and Jelliffe, Smith Ely: The Standard Family Physician 514
Report of the Surgeon-General of the Army for the Secretary of War 365
Report on the Origin and Prevalence of Typhoid Fever in the District of Columbia... 743
Robinson, Byron: The Abdominal and Pelvic Brain with Automatic Visceral Ganglia 593
Rockwell, A. D.: The Medical and Surgical Uses of Electricity 288
Ruddiman, E. A.: A Manual of Materia Medica 743

Savage, William G.: Bacteriological Examination of Water-supply 69
Saville, Thomas D.: Clinical Lectures on Neurasthenia 590
Schäfer, Edward A.: The Essentials of Histology, Descriptive and Practical..... 518
Schleif, William: Materia Medica, Therapeutics, Pharmacology, and Pharmacognosy.. 591
Shoemaker, John V.: A Practical Treatise on Materia Medica and Therapeutics..... 68
Simon, Charles E.: A Manual of Clinical Diagnosis by Means of Microscopical and Chemical Methods 743
A Text-book of Physiological Chemistry 741
Sobotta, Johannes: An Atlas and Text-book of Human Anatomy 140
Sollmann, Torald: A Text-book of Pharmacology 138
Starr, M. Allen: Organic and Functional Nervous Diseases 139
Stelwagon, Henry M.: A Treatise on Diseases of the Skin 891
Stengel, Alfred: A Text-book of Pathology. 141
Stenhouse, John, and Ferguson, John: Pathology, General and Special 365
Stephens, A. F.: The Essentials of Medical Gynecology 892
Stevens, A. A.: A Manual of the Practice of Medicine 894
Stimson, Lewis A.: A Practical Treatise on Fractures and Dislocations 895
Stoney, Emily A. M.: Materia Medica for Nurses 141
Surgery: Its Principles and Practice. Edited by W. W. Keen 211
Theobald, Samuel: Prevalent Diseases of the Eye 208
Thornton, E. Quin: A Pocket Formulary... 211
Wachenheim, Frederick L.: The Climatic Treatment of Children 894
Wells, H. Gideon: Chemical Pathology..... 516
Wilcox, Reynold Webb: Materia Medica and Pharmacy 894
Pharmacology and Therapeutics..... 741
The Treatment of Disease..... 591
Wiley, Henry W.: Foods and Their Adulteration 515
Williams, J. Whitridge: Obstetrics..... 890
Witthaus, R., and Becker, Tracy B.: Medical Jurisprudence, Forensic Medicine, and Toxicology 440